The Metalworking Weekly





Business

Communication:

Put it on executive-saving time

-page 103



No. 4 in 1955 Management Series

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AN EASY WAY TO SELECT HIGH INTERRUPTING CAPACITY STARTERS

50,000 KVA*	POWER	FUSES	VALIMITOR		
2200-5000 volts	2300 Volts	4800 Volts	s 2300 Volts 4800		
2200-5000 Volts	150,000 kva	250,000 kva	unlimited kva bus		

^{*} Certified



nals and rear of contactor.

BREAK

YOUR BEST BUY FOR SHORT CIRCUIT PROTECTION

EC&M (2200-5000) MOTOR

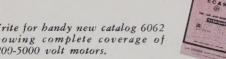
No matter how you figure it . . . high voltage motor starters, with adequate interrupting capacity, are your best investment.

Should a fault occur, vital drives are protected by clearing the circuit quickly. The need for extensive repairs or replacements has been minimized. Down-time is reduced. This results in lower costs.

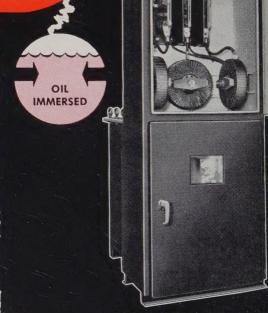
Although short circuit values get greater as KVA capacities grow, EC&M's complete line of Motor Starters provides a wide range of selection to cover any requirement. They are available in Oil and Air-Break styles having interrupting capacity ratings shown above . . . note there are 3 ratings in both oil and air break.

The ceiling on the short circuit problem has been lifted. Be sure you have the information on this wide choice of EC&M Motor Starters for 2200-5000 volt motors.

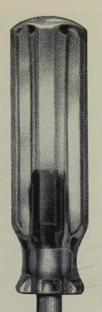
> Write for handy new catalog 6062 showing complete coverage of 2209-5000 volt motors.







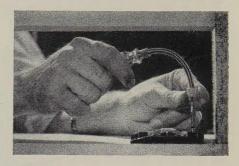
EC&M Oil-Break Starter a VALIMITOR type has ZHS 50,000 KVA Contactor moun ed under oil in rear tank.



Attractive screw-driver kits include an unbreakable plastic handle and a selection of blades for the handyman's pocket.



The flexible wire shaft of this handy model makes it easy to get at screws when there's no elbow room to spare.



aking

millions of screw drivers for the nation's handymen

A visit to the busy plant of Oxwall Tool Co., Ltd., at Oxford, N. J., is one to make the handyman's eyes gleam. Here he sees more sizes and varieties of screw drivers than he ever dreamed of. Small ones, big ones, and a variety of special types. Many are packed in attractive kits and sold all over the world.

Oxwall is a large user of Bethlehem special-purpose screw-driver wire in round and square sections, and supplied in both carbon and alloy grades.

Bethlehem makes just about every kind of steel wire. And we control the entire steelmaking process from mining the ore right down to the final drawing of the wire. Some are general-purpose grades; others, like screw-driver wire, are tailor-made for a specific application.

We'll be glad to work with you all the way in helping you to get the most from your steel wire. Just write us at Bethlehem, Pa., or at our nearest sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



BETHLEHEM WIRE



thousands and thousands and thousands and thousands

OF SKF
SY UNIT PILLOW BLOCKS
GOING INTO SERVICE



SY Unit Pillow Block



FY Flanged Housing



Aligning Bearing Unit



Order from authorized SSF distributors anywhere. The red and white SSF box encloses the finest bearings made.

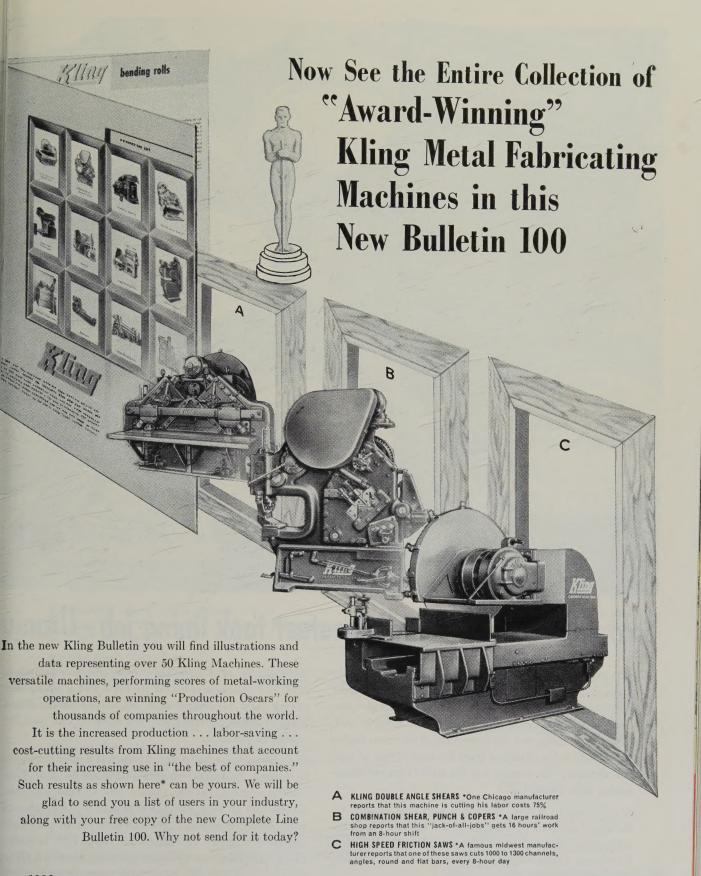
Because they have the most effective bearing sea ever perfected—the famous BCF Red Seal, made of DuPont "Fairprene". Because external rotating flingers exclude dirt. Because they are easy to install on standard shafting... Because they are interchangeable with existing installations. Because they are available promptly from distributors' stocks for shaft diameters 3/4" to 215/16'

5KF INDUSTRIES, INC., PHILADELPHIA 32, PA.-manufacturers of **5KF** and HESS-BRIGHT® bearings

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5KF

BEARINGS AND PILLOW BLOCKS



nce 1892



Makers of Friction Saws; Shears—Rotary, Double Angle and Guillotine; Punches; Combination Shear, Punch and Coper; Angle and Plate Bending Rolls; Bulldozers.

Export Distributor: Simmons Machine Tool Corp., 50 E. 42nd Street, New York 17, N. Y.



Gold mine refuse + World's greatest tank lining job = Uranium

URANIUM now is being recovered from the yellow mountains of slimes residue surrounding the gold mines on the Rand in South Africa. The process involves treatment of the abrasive, spent ore with sulfuric acid. No small problem was the protection of the many tanks, pumps and miles of piping from the twin attack of acid and abrasion. The answer was the world's largest sheet-rubber tank lining job.

A vital role in solving the many problems created by the sheer size and remoteness of the installations, plus subtropical heat and rains, was played by the G.T.M.— Goodyear Technical Man. Most important was his specification of PLIOWELD — especially compounded, acid- and abrasion-resistant rubber—and a *chemically curing* field procedure that eliminated sectionalized tanks or filling the tanks with hot water to vulcanize the rubber to the metal.

Over six and one-half acres of PLIOWELD have been used to protect equipment in this operation to date. Ultimately, some 1,250,000 square feet of tank surfaces, 50,000 feet of pipe and 1,000 pumps will be armored with rubber. How can PLIOWELD help you in your fight against corrosion? For details, see the G.T.M. or write: Goodyear, Industrial Products Division, Akron 16, Ohio.

Plioweld-T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

PLIOWELD Tank Linings by

YEAR

THE GREATEST NAME IN RUBBER



MAY 16, 1955

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Its versatility grows. It can tell nodular from gray iron and test thickness

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Etching expands as a tool for metalworking. Aircraft plants are using it to mill aluminum sheets and forgings

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It broke a bottleneck in a Canadian plant. Now, heating keeps up with the merchant mill, scale loss is down

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Editorial & Business Staffs, 16. Advertising Index, 176. Editorial Index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 W. 39th St., New York 18, N.Y.

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PINIONS

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NEW

SHAPE

FOR USERS OF 10-LB. PIGS



- NO FREE-CARBON POCKETS
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- LESS BREAKAGE
- EASIER HANDLING

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Merchant Pig Iron Division of



behind the scenes



The Acid Test

What would you say about a man who aims to rear back and throw bricks at 3074 metalworking plants where pickling operations are performed?

That's just what Joseph A. Snook, executive vice president, Atlas Mineral Products Co., Mertztown, Pa., plans to do.

Mr. Snook's company makes corrosion-proof cement. He wants to dunk samples of it in pickling tanks all over the country. His first mailing of a few carloads of sample briquets is ready, and we expect direct mail advertising boys are watching this operation with more than usual interest. It's the first time post offices will have been flooded with bricks, and it's the first bulk mailing we ever heard of being steered directly into acid tanks.

Glad All Over Department

Pride has several meanings: For one thing, it means a reasonable delight in achievements. Just for kicks, it also means a pack of lions. Since we are usually uneasy in the presence of cats, let's skip them and return to the delights of achievement.

In the 17th annual editorial competition conducted by *Industrial Marketing*, 470 entrants eyed the 18 certificates and 5 plaques that were dangled as prizes. Anybody with half an eye, as the saying goes, could see that there were scarcely enough prizes to go around, and that at least 447 publishers were going to continue publishing with tears in their eyes.

As it happened, three Penton publications, STEEL, Machine Design and Foundry, knocked off five awards among them. The "reasonable delight in achievement" reflected hereabout is a poor definition of the actual pride felt by the Penton people. The Machine Design and Foundry crowd is jumping, man; and the STEEL gang is rocking, Jack, rocking. STEEL received a real gone bronze plaque for its Program for Management—1954, and an award of merit for its covers.

Since the inception of *Industrial* Marketing's annual editorial competi-

tion among business papers 17 yea ago, no other metalworking public tion has won so many awards STEEL. It sort of makes us nervo to work for a magazine that goo makes our shortcomings that mu more noticeable.

Whatsa' Cook, Mac?

Out in Stanford, Calif., Scient Service boys are writing up the findings in something that looks light gleanings from the United Nation wastebaskets. They call this not gobbledygook Interlingua, and its inventors claim that if you have smattering of English, French, Geman, Italian, Spanish and Portuge you can understand the stuff at sign A knowledge of Gaelic or Algonou won't help you at all, as far as I terlingua is concerned, but that not too important: Persons who knowledge languages best seldom can coverse even with one another, anyware

Here's a paragraph in Interling taken from a news bulletin fro Stanford Research Institute: " lumine solar que nos vide—e le po tiones ultraviolette e infrarubie q nos non pote vider—es un radiati electromagnetic, exactemente con le undas de radio e television."

No wonder that only canis nut and Anglais homos go out in t noonday solar!

The Matched Equation

The puzzle fans had no troul with Hasraphij's horses; so many leters arrived at once we can't I them all. All writers agreed the one red stallion was worth five gray mares; one brown mare, toold gray mares; one black colt, foold gray mares.

Next time you're out with frien astound them with this one: Arran nine matches in this manner, the slyly invite anyone to correct the equation through the strategem moving only one match:

1 - 111 = 11

Shrollu

consumer *Net prices*for SIMONDS grinding wheels

SIZES	VITRIFIED A	ND SILICATE BONDED	
6x3/4 (Cont) WA46-K8-V2 WA46-K8-V2-1/2 F WA46-M8-V1	100 250 1.99 1.82 A	ST STZES PHI CHI DEST	HOW EASY IT IS TO USE!



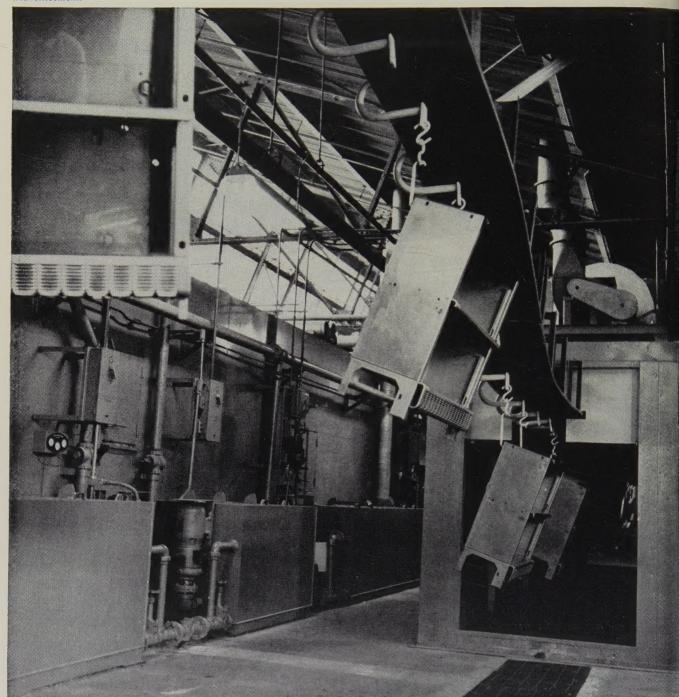
Grinding wheel users will find this book a boon to the problems of grinding wheel pricing and delivery. Here, shown together for the first time, is complete availability of all the stock items of Simonds Grinding Wheels and Consumer Net Price per wheel in every ordering quantity.

SEND FOR YOUR COPY

SIMONDS ABRASIVE COMPANY . PHILADELPHIA 37, PA.

Branch Warehouses: Boston, Detroit, Chicago, Portland, San Francisco Distributors in Principal Cities
ivision of Simonds Saw and Steel Co., Fitchburg, Mass. • Other Simonds Companies: Simonds Steel Mills, Lockport, N.Y.,
Simonds Canada Saw Co., Ltd., Montreal, Quebec, Lion Grinding Wheels Div., Brockville, Ont. and
Simonds Canada Abrasive Co., Ltd., Arvida, Quebec





AMERICAN INDUSTRY IMPROVES PRODUCTION...THANKS TO GAS

This is a gas-fired drying oven at the John J. Nesbitt Company in Philadelphia. The Company manufactures heating, ventilating and air-conditioning products, ranging from baseboard radiation to large volume blower fan units. This oven is one of the largest of its type in the country. It can take pieces up to 10 feet long on an overhead conveyor. Each can be painted a different color without interrupting the flow of the production line.

Throughout the entire process at Nesbitt's, Gas is installed as part of the line. The flexibility of Gas allows

close temperature control in a series of chemical bath and rinses preceding the drying and paint-baking process and without expensive heat-up periods. The dry-of oven is ready in just 10 minutes, and the paint bak oven is ready in less than 25. Gas is used because it i faster, cleaner, and keeps operating costs down.

The John J. Nesbitt Company finds Gas the mos satisfactory method of heat processing for its operation. That's reason enough for you to discuss your problem with your Gas Company's industrial specialist.

American Gas Association.



Tough, versatile Royalite has found increasing and diversified uses in the aircraft industry.

Cessna Aircraft Company, Wichita, Kansas, builders of fine personal and executive airplanes, was among the first to recognize Royalite's advantages.

Royalite was first used in the Cessna 170 several years ago. Later, more uses were found in the Cessna 180. The luxurious new Cessna 310 has even more Royalite parts, many in the handsome interior. There have been increasing uses with each new model. Yes, the aircraft industry, like so many other industries, is finding more and more uses for Royalite. Here are 6 of the important reasons:

- Tough, high impact strength, and long wear.
- Beauty and durability of color and grain finish.
- Lighter weight than commonly used metals.

- Low tooling costs and inexpensive forming operations.
- Resistant to most oils, acids and chemicals.
- Engineering and design versatility for contours and sharp detail.

Manufacturers in almost every field have used Royalite in solving production and cost problems. There's a Royalite use for *your* product. Get all of the facts. See how Royalite can improve appearance and performance—*and cut costs*.

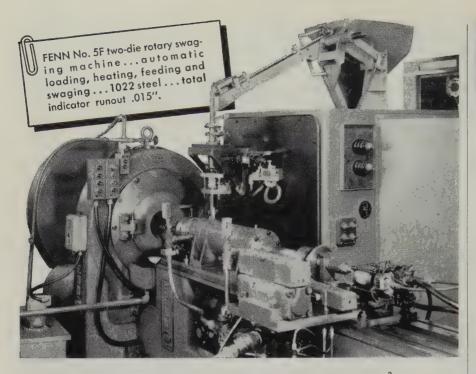




Write, wire, phone:

UNITED STATES RUBBER COMPANY

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Change to to at 500 per hour with full automation

FENN offers to the metal industry . . .

- a completely new and automatic swaging package
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Now, more industries can profit from hot or cold swaging. Present users of swaging machines can greatly increase their productivity. Or we can design a complete assembly to suit your requirements.

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he	Fenn Manufacturin	a Company	552	Fenn Road	Newington.	Connecticut

Please send me	more inf	formation	about	your	Rolling	Mills	
Swaging Machin							

Name		Title	
Company			
City	Zone	State	

LETTERS

Stamp of Approval

I feel your article, "Stamping Sales: Up 10% in '55" (Apr. 4, page 36), points out both diversification and competition. These are healthy symptoms of an economy working its way toward more efficiency, keener market evaluation and steady product improvement.

Your article appears to be more evidence that the American economy is holding its own and advancing into a firmer state of better security. Perhaps the rise in stamping sales is based on the rise in production of the automotive industry. But the emphasis on diversity keeps the end result from being dependent on this single factor.

Cliff Miller director of public relations Designers for Industry Inc. Cleveland

• Thank you.—ED.

Make or Buy?



We have urgent need for tear sheets or information on . . . when it is more economical to purchase parts or components than to manufacture them. We would appreciate a prompt reply.

> Ted Grange public relations director Stewart-Warner Corp. Chicago

• Being torwarded is a tear sheet of the article, "Job Shops: Six Paths to Protit" (May 2, page 73). Part of this article deals with whether it is more economical to buy or to make. Also being sent is a pamphlet by Clement C. Caditz, president of Northern Meta. Products Co., on Stampings—Make Them? Or Buy Them?—ED.

Nailmakers Sought

How may I secure a list of nai manufacturers in the United States and abroad? Any suggestions will be appreciated.

E. D. Sperry Jr P. O. Box 930 Santa Barbara, Calif

• We are torwarding a list of 35 do mestic producers of nails, taken from the 1954 edition of Guide for Stee Buyers. Sorry, we don't know how to track down a listing of those abroad.— ED.

Useful Inventions

One of our associate companies is South America wants a Patent Boarlisting entitled Food Products and Processes, which contains abstracts on government-owned patents. It was mentioned in the "Windows of Washington

(Please turn to page 12)



76 million gallons of water in 9600 hours

.. that's average for a Chrysler Industrial V-8-powered irrigation pump in West Texas

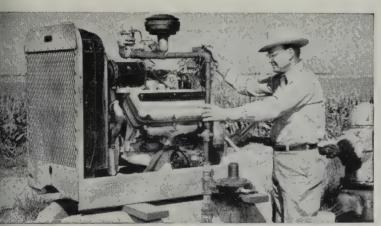


Photo courtesy Louthan-Dowell Motors, Lubbock, Texas

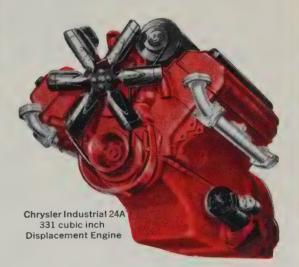
k any grower in West Texas what the local performance record r an irrigation pump is and, chances are, he won't know... records broken every day in Texas. He just assumes his pump will bring ter up approximately 320 feet in sufficient quantity to irrigate his tire crop every day of his 120 to 200 day growing season.

But ask any West Texas grower what engines power his irrigation mps, and if he's like better than 85% of West Texas growers, he'll you — Chrysler Industrial. And if you ask him why, you will get answer based upon better than fifteen years experience — his own d his neighbors'.

For instance, a West Texas grower might tell you that, among htweight high-speed engines operating on either butane or natural so, Chrysler is the only engine equipped with all the truly industrial gine features. As examples he could mention features like sodiumbled exhaust valves with extra-hard stellite valve heads and valve its, heavy duty induction hardened crankshafts and large tri-metal arings. Finally he would probably point out that a single Chrysler dustrial Engine has been driving his centrifugal pump nearly ten ars without a major overhaul while during the same period comitive power plants may likely have required two or three overhauls.

If it's real industrial power you need . . . for irrigation or any other aipment, you can't buy an industrial engine to equal Chrysler, 230 413 cubic inches displacement. For details, see a Chrysler Industrial gine Dealer, or write: **Dept. 85** Industrial Engine Division, Chrysler reporation, Trenton, Michigan.

Lloyd Huffaker, Lubbock, Texas, stands beside his Chrysler Ind. 24A-powered irrigation pump. In 2½ years, Mr. Huffaker has irrigated three crops of cotton, inaize and alfalfa, his pump and Chrysler Industrial Engine operating approximately 133 twenty-four hour days during each season. Pump has delivered an average of 1000 gallons per minute, for a grand total of 576,000,000 gallons of water. Total maintenance repair in 2½ years: One set of spark plugs and three sets of points installed at total cost of \$10.00. If the total revolutions this engine has turned were reduced to miles, they would equal approximately 336,000 miles—or more than thirteen times around the world.



CHRYSLER Industrial Engines

INDUSTRIAL ENGINE DIVISION . CHRYSLER CORPORATION



MORTH CAROLINA

industrial sites like this-



provide attractive opportunities for

MANUFACTURERS of HARDWARE and other

FABRICATED METAL PRODUCTS

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Mountain, piedmont and coastal areas have abundant native-born, cooperative labor with a fine record of productivity.

Furniture hardware and a wide range of metal products have many potential purchasers here and in surrounding states, plus major markets within overnight reach. Raw materials are accessible from northern and southern suppliers.

Transportation, power, natural gas
... year-round moderate climate
... a favorable tax "package" that
adjusts to the rise and fall of business conditions . . . friendly State
and local governments—these are
some of the factors which contribute to the success of metalworking plants in North Carolina.

A special brochure is available upon request to Ben E. Douglas, Director, Dept. of Conservation & Development, Raleigh 10, N. C.



LETTERS

(Concluded from page 10)

department (page 48) in your Nov. 22, 1954, issue. Can you advise us where it can be obtained?

E. Davis Bunge Corp. New York

• It may be purchased from the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.—ED.

Men Want Muscles

The article, "More Muscles in Steel" (Apr. 25, page 96), was of great interest to our estimating department. The 15 men in it would like copies.

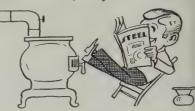
Roy Hermanson chief estimator, Dept. 174 Axelson Mfg. Co. Los Angeles

We have found this article to be interesting and informative. Please send a copy for reference.

George R. Beck production engineer Development Laboratories Pacific Division Bendix Aviation Corp. Burbank. Calif

• Sent.—ED.

Hot Stove Query



Can you give me information about the stove pictured in the article, "Metals' Growing Stake in Housing" (Apr. 11, page 65)? Is this stove available and from whom?

Mrs. O. F. Lenk 25 Aberdeen Drive Middletown, O.

• You can't hardly get them no more . . . that is, it you mean the old, not the modern stove. The Amity stove was made by the Gill Stove Co., Rochester, N. Y. We don't believe the company is still in business, having checked our records as tar back as 1926. For turther information on either stove, we suggest you write the Crane Co., 836 S. Michigan Ave., Chicago 5, Ill. It supplied the photographs.—ED.

Job Shop Analysis

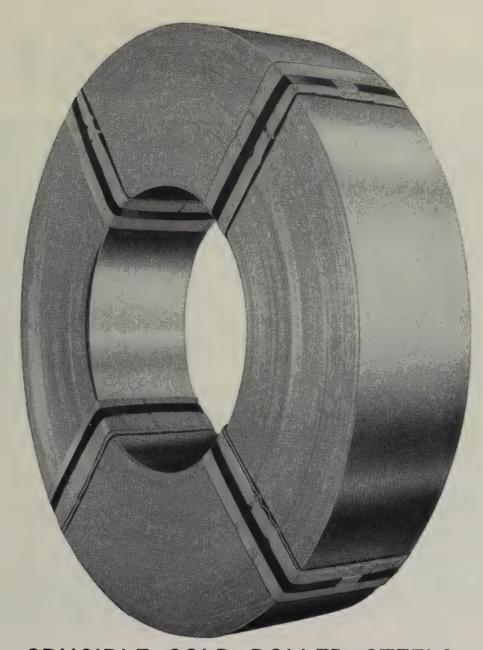
I have read your article, "Job Shops: Six Paths to Profit" (May 2, page 73), with interest. The analysis of the job shop business in this article is one of the best I have seen in recent years. May I have three copies?

Fred Schlosser Jr. Schlosser Mfg, Co. Philadelphia

Please send three copies. I want them for a meeting of the National Tool and Die Manufacturers Association in Washington.

Willis G. Ehrhardt Erhardt Tool & Machine Co. St. Louis

• Sent.—ED.



choose CRUCIBLE COLD ROLLED STEELS

for finer finish...better edges...closer tolerances

Crucible's *complete* quality-control during production of cold rolled alloy specialty strip steels means *extra* performance in your shop. And Crucible-patented production equipment makes possible cold rolled steels with finer finish, better edges, greater physical uniformity, and closer tolerances.

At Crucible, the country's leading producer of *special purpose steels*, you'll find a group of metallurgists experienced in cold rolled steels who are ready to help you develop your specification. You'll get the steels you choose fast, too, for Crucible cold rolled stocks are large... both in coils and cut lengths.

So come to Crucible for all your cold rolled steel needs. Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 30, Pennsylvania.

CRUCIBLE

first name in special purpose steels

rucible Steel Company of America

Reduce Cost of





TRANSFORMERS

Well-balanced design and extra-heavy duty construction are used in the Allis-Chalmers arc-furnace transformer. Past records show ability to withstand as much as 25 to 30 years of the repeated daily short circuits encountered in furnace operation. Extremely heavy supports and structure are used to brace coils against the severe short-circuit stresses.

Skillful insulation techniques protect windings from overvoltage due to wide tap range. Some units are designed for as much as 50% range in secondary voltages. Tap-changing mechanism, specially designed for arc-furnace transformers, is in separate compartment to facilitate maintenance. Wide flat contacts provide the long life needed for numerous daily tap-changing operations.

ALLIS

Arc-Furnace Steel

Jse Allis-Chalmers Integrated lectrical Equipment—and you...

SAVE on Engineering — Allis-Chalmers steel mill specialists coordinate equipment, submit single complete package proposal.

SAVE on Purchasing — One order, one invoice, one follow-up for the complete furnace electrical system.

SAVE on Installation — All components are matched for easy installation. Delivery is coordinated to prevent delays.

SAVE in Operation — All equipment is designed and built to work together. One reliable supplier guarantees performance of complete electrical system.

PAKE ADVANTAGE of Allis-Chalmers complete line of arc-furnace equipment—transformers, *Regulex* control, switchgear, associated controls—backed by 45 years of experience. Call your nearby Allis-Chalmers District Office for assistance when you are planning new facilities or nodernization. Or write Allis-Chalmers, Milwaukee 1, Wisconsin.

Regulex and Ruptair are Allis-Chalmers trademarks.

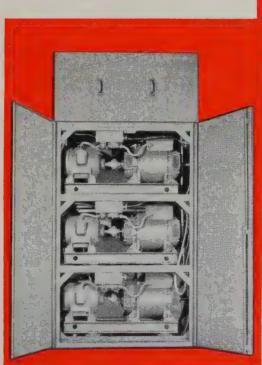
A-4742

REGULEX CONTROL

Balances arc current with arc oltage almost instantly—mainains desired arc conditions by utomatically varying distance etween electrode and charge.

With Regulex rotating ampliier there are no contacts or witching devices between the egulator and electrode motor. Continuously closed circuit proides constant positive control, ninimizing current surges, cuting power consumption.

Simple design of Regulex reults in lower maintenance. rovisions for spare unit mounted in top assure continuous operaion under all conditions. Tier construction — open or enclosed —conserves valuable floor space.







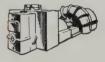
Wide Range of Motors for main mill and auxiliary equipment drives ac or dc—from 1 hp to 10,000 hp and supporting m-g sets or rectifiers.



Transformers for mill service include metering transformers, distribution transformers, power transformers, and unit substations.



Switchgear ranges from low voltage metal-enclosed units to large metal-clad types — includes Ruptair and oil circuit breakers. Also large power circuit breakers.



Blast Furnace Blowers are a part of the A-C line of single and multistage blowers, axial and rotary compressors, and vacuum pumps for the steel industry.



Power Generation Equipment includes steam turbine-generator units 2000 kw and larger for fluctuating steel mill loads. Also condensers, pumps and auxiliary-drive motors.

CHALMERS





When you need tubular rivets, you want them GOOD and you want them FAST. 5 Milford plants and 19

Milford offices see that you always get BOTH!

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SAVING IDEAS



GISHOLT

Presented as a service to production men, we hope some of these interesting ideas, chosen from thousands of jobs, will suggest ways to help cut time and costs in your own work.

MASSIVE FLYWHEELS COMPLETED IN ONE AUTOMATIC OPERATION

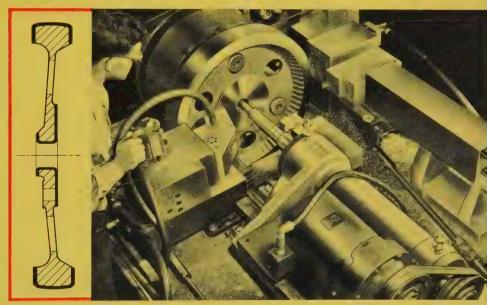
nplimatic Automatic Lathe Balancer Team Up to ve Down Costs

machining on this 320-lb. castn hay baler flywheel is completed one chucking on this Gisholt Simmatic Automatic Lathe. The part hucked in three cored holes in the b. V-grooves in the chuck jaws stralize the work and give a truening web. Spring-loaded jacks wide support and eliminate vibran.

four front slide tools straddle face rim, face the center pad and chamthe back edge. A cam-guided tool the rear slide turns the OD crown d another tool chamfers the outer ge of the rim. Both slides have comatic tool relief. Two tools on a oted speeder boring bar mounted the center slide finish the bore and hird tool chamfers. A back boring achment, operating through the ndle, completes the job by shave ing the back pad and chamfering bore. Eleven tools machine ten faces in seven minutes f.t.f.

While a new workpiece is being maned, the operator places the comted part in a Gisholt 14E Static lancer. This is arranged with cortion equipment so that unbalance be measured, located, corrected inspected in one handling.

m rough casting to machined and baled flywheel—all done by one operator the two Gisholt machines.



Heavy lines show ten surfaces

Close-up of workpiece and tooling. Note speeder boring bar arrangement to give required cutting speed in small bore diameter.



V-grooved chuck jaws and spring-loaded jacks. Back boring attachment tools feed out through the spindle to face back pad and chamfer bore.



Gisholt 14E Static Balancer with integral correction equipment. Up to 600 ounce-inches of unbalance can be quickly measured.



TIME-SAVING IDEAS

HOW TO DO LONG SHAFTS ON SHORT LATH

Ram Type Machine
Shows How Good Idea
Can Save on Equipment Costs

A

The long and short of this pointer is worth remembering the next time you have a problem like it.

Here, a Gisholt No. 4 Ram Type Turret Lathe, which has 25¾ inches from hexagon turret face to spindle, is handling a 46½-inch-long shaft. The seamless steel tubing is fed through the spindle and locates against stock stop "A" for simple

turning, reaming, necking and threading operations. Then the hexagon turret is indexed so that stop "A" again faces the work. The stop is hinged and flips up, permitting the bar stock to pass completely through the turret and locate against stop "B." The body of stop "A" acts as a steadyrest to prevent whip while the shaft is cut off to length from the rear tool

post on the cross slide. Stop "B" the also swings out of the way for extremoval of the finished shaft. I whole job takes only 2.75 minufloor-to-floor.

By simply allowing the workpiece to p through the hexagon turret, a shaft need twice the length of the machine's capa can be handled—sparing the need to larger, more costly lathe.

TURRET-MOUNTED LOADER SPEEDS CHUCKING

Gisholt Fastermatic Automatic

Turret Lathe uses Loading Arbor
to Save Time and Effort.

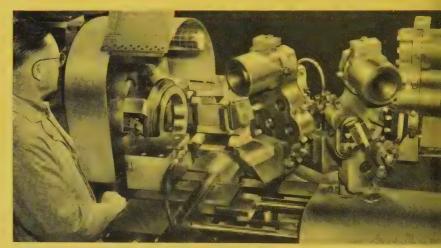
Even if you have your machining time down pat, you may still be able to cut over-all time further with a better loading method.

Here, to simplify and speed up chucking operations, this 2F Fastermatic has a special turret-mounted loader arrangement. As each machine cycle ends, the finished part is removed. Then forward movement of the hexagon turret carriage brings a rough workpiece on the loading arbor to the chuck. Spring-loaded studs on the arbor force the piece against the chuck jacks to locate the work.

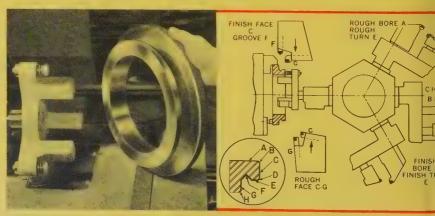
With simplified loading and chucking and a fully automatic machine cycle, time is just 6.9 minutes f.t.f.

The hexagon turret stations are tooled to turn, bore and chamfer with all facing and grooving operations on the steel rings performed from the front and rear cross slides.

Using a loading arbor on one turret face of the Fastermatic Automatic Turret Lathe reduces manual effort and simplifies chucking.



Tooling setup for first operation machining on steel rings.



Here's the special turret-mounted loader. Also a finished part showing surfaces machined.



TOMATIC LATHE DOUBLES AT PERFINISHING AND BEARINGIZING

olt No. 12 Hydraulic Lathe ots for Special Work

many of those special jobs that along present equipment can a hand. This unique application Gisholt No. 12 Hydraulic Lathe, be three jobs are performed in one aling, is a good case in point.

re, it is specially tooled to finish motive transmission converter h housing and bushing assems. Two No. 1 Superfinishing hments are mounted on the rear pendent slide. One Superfinishes lat hub face (A) of clutch housfor thrust washer contact. At the time the 45-degree sealing face is also Superfinished.

hile this part is being Superfin-1, the preceding workpiece has 3-inch bore (C) sized and find by a vertical Bearingizer unit, mounted on the No. 12 raulic Lathe.

oduction is fast—over 50 parts nour. Tolerances are closely held the required "controlled" surface h readings easily obtained.



By simple adaptation, this No. 12 Hydraulic Automatic Lathe performs as a special machine to produce Superfinished and Bearingized parts.

To show tooling, Superfinishing quills are withdrawn, Bearingizer unit is raised. While part is Superfinished, another is Bearingized.

TIME-

READ-GRINDING WHEELS BALANCED FOR MORE PRECISE WORK

Gisholt DYNETRIC Balancer Measures, Locates Unbalance to Eliminate Harmful Vibration

ead-grinding wheels operate at speeds and therefore must be accurately balanced to eliminate ation which would hamper ding to close tolerances. For this of workpiece, where the length g the axis is small compared to diameter, correction is usu-

For A Clear Picture . . .

of the various plans under which you can acquire new machine tools, you'll find this a very helpful booklet. It explains and illustrates time-buying and leasing methods to show how you can benefit from these methods. Write for Booklet P-1173.

ally made only for force (static) unbalance.

For fast, simple, low-cost balancing this Gisholt Type 3S DYNETRIC Balancing Machine is used. It is easily set up to measure and locate force unbalance. The strobe lamp flashes on the numbered band and indicates which of the tapped holes provided in the mounting flange plate will receive the correction weight. At the same time, the amount meter tells the operator exactly which weight screw is to be added to bring the part into precise balance.

By eliminating vibration, grinding wheels rotate very smoothly and produce better threads to closer tolerances.



Balancing, performed on new wheels and after dressing old wheels, assures accuracy and improves performance.

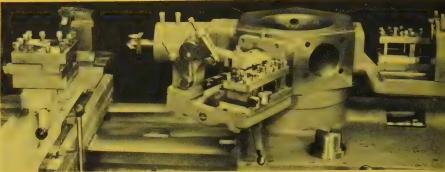


Complete courses covering all phases of precision balancing are offered by the Gisholt Balancing School. Get details and starting dates.





MULTIPLE TOOLING ANSWERS SMALL LOT PRODUCTION



This tooling arrangement makes an ideal setup for the various machining operations shown in the layout. As few as five pieces per lot are handled economically this way.

Here a standard Gisholt 3L Saddle Type Turret Lathe is multiple tooled with lots as few as five pieces handled Type Saddle Type Lathe Produces Coupling Hubs Faster, More Accurate tool blocks and adjusts the multiple cutter turner rollers. Special stops on turret tooling determine the length of the saddle standard Gisholt 3L Saddle tool blocks and adjusts the multiple cutter turner rollers. Special stops on turret tooling determine the length of the saddle standard Gisholt 3L Saddle tool blocks and adjusts the multiple cutter turner rollers.

economically. The lathe is equipped with a bridge-type cross slide and is tooled to machine steel flexible

coupling hubs from bar stock.

All tooling for the several different

All tooling for the several different sized parts is pre-set. This includes the group of tools on the rear of the cross slide and also the special tool blocks held in the multiple cutter turners on the hexagon turret. To go from one part size to another, the operator merely changes these special

tool blocks and adjusts the multicutter turner rollers. Special stops on turret tooling determine the let of all turned diameters and shou positions directly from the end o piece. These stops eliminate the required to set turret stops. Als stock stop to position the work p to starting machining operation not required.

With this kind of interchangeable pr tooling on Saddle Type Turret Lathe, have a high-production setup which co used for small lots.

GROOVE X BACKFACE K TURN F-H CUT OFF SHAVE C BACKFACE K TURN F-H CUT OFF SHAVE C

HOW SPOT CHECKING SAVES TIME ON SUPERFINISHING JO

Superfinishing, as you may know, is the process whereby a "controlled" surface finish can be quickly and economically obtained, piece after piece —whether the specified final finish is 50, 30, 10 or 1 micro-inch RMS.

In small job shop operations, various parts are handled and finish requirements vary considerably. This necessitates some means by which the operator can determine when he has produced the specified surface finish on a part.

This standard Gisholt 51A Superfinishing Machine is equipped with a Profilometer Unit. This provides a means of instant checking the sur roughness of the part being Su finished at any time during the Su finishing operation. The part do have to be removed. It's possib Superfinish each individual par the blueprint tolerance before lea the machine.

Superfinishing is made even more eff and lower cost with this means of ke a "running" check on surface rough It's ideal for handling small lots and we different surface finishes are specified

Write for book, "Wear and Surface Fi which gives full information on Superf



Operator is checking surface finish reading with inspection equipment mounted on Gisholt 51A Superfinisher.

No. 5-655 639

THE GISHOLT ROUND TABLE represents the collective experience of cialists in the machining, surface-finishing and balancing of round and pround parts. Your problems are welcomed here.

Inspection Equipment on Machine Speeds Small Lot Operations

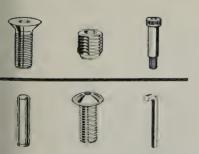
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How the Steel Industry Is Fighting Air Pollution



When the public hears about dust and fume control it is often in terms of what has not been done. It is important that they should also know what has been done, because the record of the steel industry is one of the most progressive.

The purpose of this discussion is to give the executives the facts to prove this point.

Q. First of all, how can you measure the progress of dust and fume control in the iron and steel industry?

A. As you know, there are many ways to combat air pollution. Equipment and methods vary in effectiveness, but the industry agrees that electrical precipitators have the highest collection efficiencies. By keeping track of the demand for this high efficiency equipment over the years, we can get a good indication of the importance the industry places on dust and fume control and the progress they are making.

Q. Do these figures show an increasing interest in this high efficiency equipment?

A. Suppose we let the figures speak for themselves. Since 1945 precipitator capacity in the steel industry had a greater increase than in any previous ten year period. Precipitators handling about 6½ million cfm were installed during this period.

Q. But can't you attribute this growth to the increase in steel-making capacity?

A. Some of this growth is due to expanded production facilities, but that's just a part of it. For instance, iron and steel production has increased about 30% since 1945 — but precipitator capacity has increased about 130% during this same period.

Q. In the old days, I guess precipitators were used primarily in blast furnaces, weren't they?

A. That's right. The first one went into operation in 1930. Since then, 169 Research Cottrells have been ordered by the industry.

Q. What about new applications?

A. We have a number of new uses that have proven themselves on the job. Open hearths, for instance. In one installation, our precipitators reduced stack discharge to a little over 2 pounds per hour. That's quite a reduction when you consider that the discharge without a precipitator ranged from 75 to 245 pounds per hour.

Q. I understand your Cottrells are used on some sintering machines now. Is this true?

A. Yes, we have three in operation and more under construction.

Q. How about scarfing machines?

A. This is a recent application which has worked out very satisfactorily. Two precipitators are now in operation of this application.

Q. Has anything been done on suc problems as iron cupolas, electric fu naces, and ferromanganese blast fu naces?

A. Yes. Installations have been made on all these problems.

Q. How do you go about developing these new applications?

A. We work very closely with o customers on these new projects. On laboratory is a big help, and our 4 years of pilot plant experience plus ov 2,000 precipitators give us the kind of experience that leads to the successfungineering of projects like these.

If you would like to have more inform tion about these applications, or if yo want to investigate the possibility using precipitators on other equipmer our nearest representative will be gla to call on you.

RESEARCH-COTTRELL, IN

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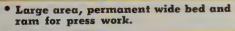
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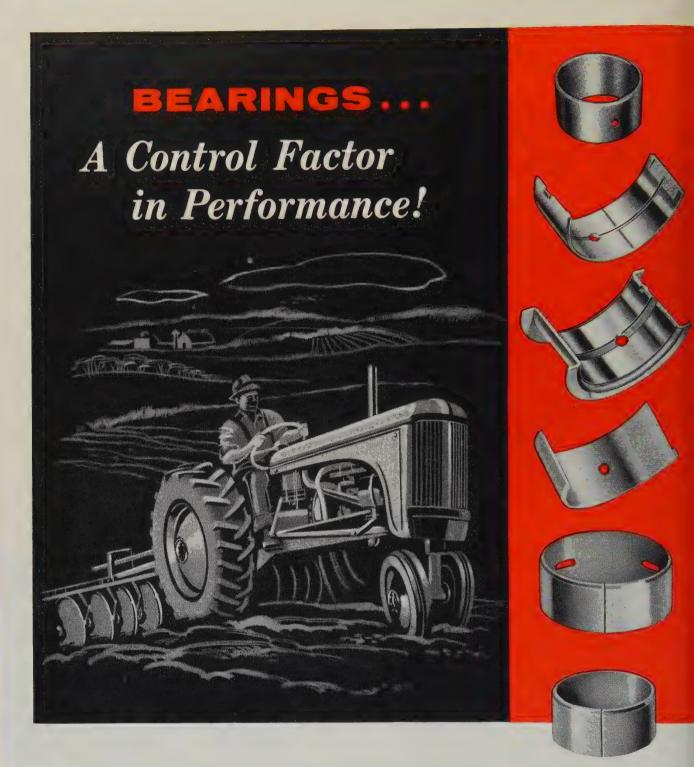




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OF MEETINGS

ay 15-18, Copper & Brass Research Association: Annual meeting, the Homestead, Hot Springs, Va. Association's address: 420 Lexington Ave., New York 17, N. Y. Secretary: F. L. Riggin Sr.

ay 15-18, Industrial Heating Equipment Association Inc.: Spring meeting, the Homestead, Hot Springs, Va. Association's address: 412 Fifth St. N.W., Washington, D. C. Executive vice president: Carl L. Ipsen.

lay 16-17, American Management Association: Special conference on collective bargaining, Commodore hotel, New York. Association's address; 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: James O. Rice.

lay 16-19, American Mining Congress: Coal convention and exposition, Cleveland Public Auditorium, Cleveland. Congress' address: 1102 Ring Bldg., Washington 6, D. C. Executive vice president: Julian D. Conover.

fay 16-20, Materials Handling Exposition & Conference: International Amphitheatre, Chi-

Connecticut Ave. N. W., Washington 6, D. C. Secretary: John C. Oliver.

May 19-20, National Industrial Conference Board Inc.: General session for all associations and 39th annual meeting, Waldorf-Astoria hotel, New York, Board's address: 247 Park Ave., New York 17, N. Y. Secretary: Herbert S. Briggs.

Iay 19-20, Refractories Institute: Annual meeting, Cavalier hotel, Virginia Beach, Va. Institute's address: First National Bank Bldg., Pittsburgh 22, Pa. Executive secretary: A. C. Newton.

May 22-24, American Steel Warehouse Association: Annual meeting, Hotel Statler, Boston. Association's address: 442 Terminal Tower, Cleveland 13, O. Secretary: Walter S. Doxsey.

May 23-25, American Management Association: General management conference, Roosevelt hotel, New York, Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: James O. Rice.

May 23-25, American Society for Quality Con-trol: Annual meeting and exhibit, Hotel Statler, New York, Society address: 50 Church St., New York 7, N. Y. Executive secretary: C. Eugene Fisher.

May 23-26, Machinery Dealers National Association: Annual convention, Netherland Plaza hotel, Cincinnati. Association's address: 1346 Connecticut Ave. N. W., Washington 6, D. C. Executive director: R. K. Vinson.

May 23-26, National District Heating Association: Annual meeting, Edgewater Beach hotel, Chicago. Association's address: 827 N. Euclid Ave., Pittsburgh 6, Pa. Secretarytreasurer: John F. Collins Jr.

May 23-28, American Foundrymen's Society:
Annual meeting, Rice-Shamrock hotel,
Houston, Society's address: Golf & Wolf
Rds., Des Plaines, Ill. Secretary: William
W. Maloney.

fay 25-26, American Iron & Steel Institute: Annual meeting, Waldorf-Astoria hotel, New York. Institute's address: 350 Fifth Ave., New York 1, N. Y. Information: Frank Ragland.

fay 30-June 1, National Association of Purchasing Agents: Annual meeting and exhibit, Waldorf-Astoria hotel, New York. Association's address: 11 Park Place, New York 7, N. Y. Secretary: G. A. Renard.

lay 30-June 10, Canadian International Trade Fair: Exhibition Park, Toronto, Ont., Canada. Information: Director of the Trade Fair, Exhibition Park, Toronto, Ont., Cana-

(lay 31-June 1, National Rivers & Harbors Congress: National convention, Mayflower hotel, Washington. Congress' address: 1720 M St. N.W., Washington 6, D. C. Executive vice president: William H. Webb.



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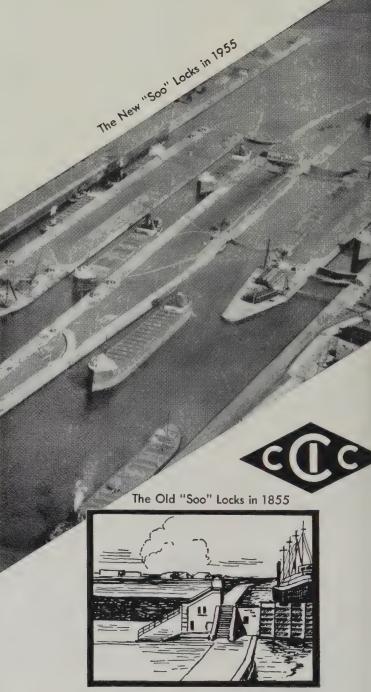
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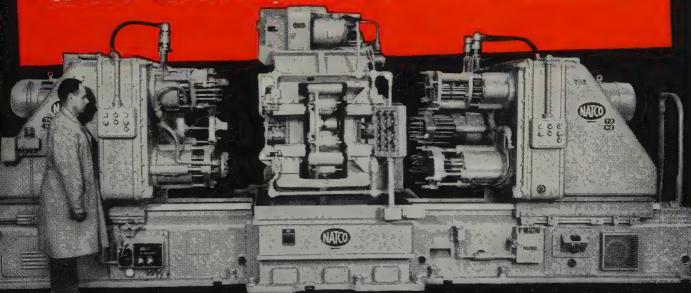


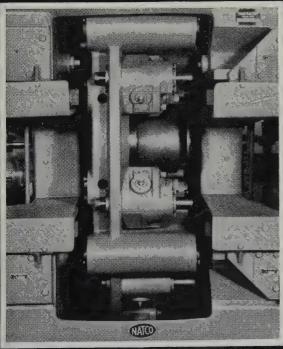




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CHAMFERED
BURRED



Total 77 OPERATIONS

Close-up view of a position Trunnion Fixture

NATIONAL AUTOMATIC TOOL COMPANY, INC.

for problems in Drilling, Boring, Facing and Tapping

Pall a Natco Field Engineer

CHICAGO, Room 203, 6429 W. North Ave., Oak Park DETROIT, 10138 W. McNichols Rd. BUFFALO, 1807 Elmwood Ave. NEW YORK, 35 Beechwood Ave., Mount Vernon





Job: A set of three special punches used on a high speed machine to close the joints on prefabricated metal window frames made from 1/8" thick SAE 1010 steel.

Set of 3 punches

2

Problem: Many types and grades of tool steels were tried, but all lacked the necessary toughness and hardening safety. Best service life from any before breakage was three days. Because a set of 3 punches cost hundreds of dollars to make, the low production was hiking up operating costs at a prohibitive rate.

Solution: In a final effort to find a steel with enough toughness and safety in hardening, the Toolroom Superintendent turned to Carpenter and the Matched Method. Carpenter R.D.S. (Oil-Tough) was

Results: Now punches stay in service for about three months, and instead of breaking, they wear out

In working with many men responsible for tools and dies, we've discovere a simple but often overlooked fact: The man who approaches each too and diemaking job with the idea of . . . Simplifying it, Reducing heat treat ing hazards, and Improving previous performance . . . is bound to do better job.

If you or your men have that approach, Carpenter wants to be of help We like to think of our association with customers as a "partnership" in mutual effort to get best possible results. And here's what we offer Practical, workable help at every step from diemaking, to heat treating through on-the-job performance.

And that's why it works . . . both of us have a common goal. Just on example of hundreds is found in the Field Report shown to the left.

One part of this program is the Carpenter Matched Set Method. It is a accurate blueprint for selecting the one die steel ideally suited to give yo the results you want. It is all outlined in a convenient, full-color Wa Chart available to you.

And that's only a part of the program . . . a program that involves almo 70 years' experience in the development of new and constantly-improve die steels. We're ready to work for you, now. Simply call your neare Carpenter Mill-Branch Warehouse, Office or Distributor. THE CARPENTE STEEL Co., 139 W. Bern St., Reading, Pa.



arpenter

Matched Tool and Die Steels

IMMEDIATE DELIVERY from local warehouse stock Export Department: The Carpenter Steel Co., Port Washington, N.Y.- "CARSTEELCO



AT CHICAGO - SEPT.



Get Extra Sub-hearth

SAFETY AND LONGER LIFE

with Kaiser Periclase D-S Brick

This superior brick has been *especially designed* to withstand sub-hearth conditions. Thus, it gives maximum protection against costly breakthroughs and provides longer sub-hearth life.

All the important properties outlined by major steel company ceramists as most desirable for sub-hearth brick are found in Kaiser Periclase D-S Brick.

High MgO (more than 95%) is achieved through the use of pre-shrunk, accurately-sized Periclase grains derived from sea-water magnesia. Absence of chrome eliminates the reduction of chromium oxide and damage to the refractory structure. (Brick contains only $0.8\%\,\mathrm{Cr_2}\,\mathrm{O_3}$.)

Low iron content minimizes refractory damage from alternate oxidation and reduction of iron oxide and other iron compounds. Absence of calcium oxide prevents damage caused by slaking during slow heat-ups or while furnace is idle. (Brick contains only $0.6\%~{\rm Fe_2O_3}$ and $1.2\%~{\rm CaO.}$)

With all its many advantages, Kaiser Periclase D-S Brick gives you the ultimate in sub-hearth safety and durability—yet costs no more!

Call or write Kaiser Chemicals Division, Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway, OAKLAND 12, California . . . First National Tower, AKRON 8, Ohio . . . 518 Calumet Bldg., 5231 Hohman Avenue, Hammond, Indiana (CHICAGO).

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- Kaiser Periclase Chrome Brick (PCA)
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Now available! A companion mortar for Kaiser D-S brick. High purity periclase composition and maximum workability.

Installation advice on request



Forming edges of top on 100-ton press brake.

Welding z-sections to underside of cooling tray.



Stainless Steel helps take film developing automatic

DRABILITY, corrosion resistance and od looks are built into this autoatic photographic developing sink rough the use of Stainless Steel the entire top section, including two trays and the center bowl.

Metlmex Corporation, Lewistown, and fabricator of this sink, makes a riety of products, working with the Stainless Steel and carbon steel, bricating equipment is used interangeably with no special tools for rking Stainless. The only differce in shop procedure lies in preutions taken to avoid marring the ooth surface of Stainless Steel.

Stainless Steel offers a unique mbination of properties—plus ease

THE UNITED STATES STEEL HOUR.

a full-hour TV program presented every er week by United States Steel. Consult your all newspaper for time and station. of fabrication. It's the answer to a wide range of design problems. And when you use it, be sure you get service-tested USS Stainless Steel.

FABRICATING FACTS

Sheets are sheared to size in a $\frac{1}{4}$ " capacity squaring shear and edges are then formed on a 100-ton press brake.

Front, sides, bowl and trays are assembled to form a complete integral stainless steel top unit. Metal-

lic-arc, heliarc, and spot methods are employed in welding temperature controlled trays and cabinets. Developer and fixing trays are attached to unit by riveting one side to stainless steel hinge permitting mechanical agitation.

Stainless steel panels are easily lock seamed to form center bowl section.

After assembly, entire unit is ground and polished to remove weld marks.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • NATIONAL TUBE DIVISION, PITTSBURGH TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.

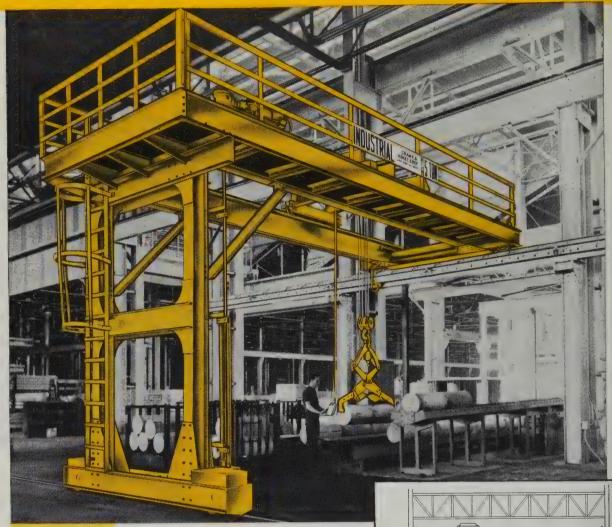
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS

USS STAINLESS STEEL

SHEETS - STRIP - PLATES - BARS - BILLETS - PIPE - TUBES - WIRE - SPECIAL SECTIONS



Industrial SEMI-GANTRYS SPEED BILLET HANDLING





An Industrial motorized Semi-Gantry does a production job handling billets from racks to a conveyor in a large metal plant.

Serving a local area in the factory
the Industrial Semi-Gantry operates on its own runway—freeing
the heavy capacity overhead crane for other important jobs,
resulting in overall savings in operation and maintenance.

Consult with Industrial Crane & Hoist Corporation for an economical solution to your materials handling problems.

The diagram illustrates the relative positions of the Industrial Semi-Gantry and the heavy capacity overhead crane, both of which operate without interfering with each other.

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Overhead Cranes • Jib Cranes • Monorail Systems • Crane Runways
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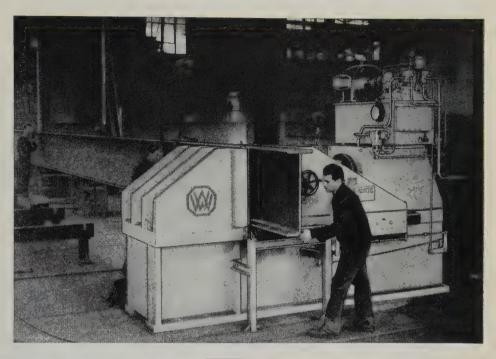


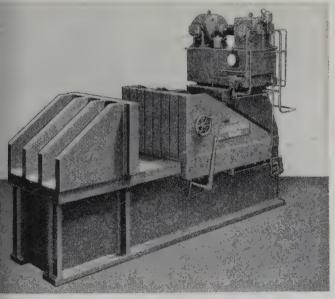
WILLIAMS-WHITE

Horizontal Bender and Straightener

The versatility of the horizonl press is well represented by a 200 Ton Hydraulic Bender d Straightener illustrated, in e installation view at right. The "x 48" crosshead and end lug ake this an excellent machine r straightening I-beams, chanls and other sections.

The forward travel of the osshead is adjustable by the indwheel mounted on the side the crosshead. In the event is stroke is not sufficient to implete the desired bending or raightening operation, the perator merely turns the handneel and the crosshead connues forward a distance proportionate to the movement of e wheel.





WILLIAMS-WHITE & COMPANY machinery is custom will to your specifications! Our designers and engineers be at your service, without obligation, to help you select apacity and type of machine most suited for your requirements. For more information consult your WILLIAMS-VHITE & CO. representative or write us direct.

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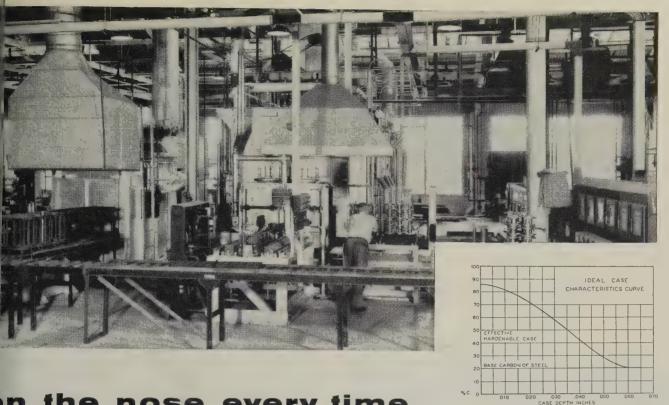
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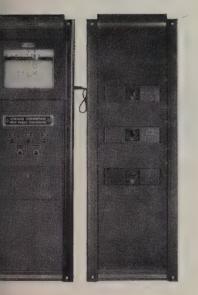
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WITH SURFACE AUTOCARB AUTOMATIC CARBON POTENTIAL CONTROL



New high physicals in carburized gears — better tooth-to-tooth and gear-to-gear uniformity-faster cycles-automatic compensation for changes in work surface area during furnace operation . . .

These are the chief benefits Warner Gear Division, Muncie, Ind., achieves in its most recent continuous gas carburizing line, using the 'Surface' fully automatic carbon potential control system. In a nutshell: The Surface dewpoint recorder-controller periodically checks carbon potential in each of three zones in the furnace (with a range of .3 to 1.1% carbon), controls mixing valves to deliver correct additions of air or gas to maintain desired carbon potential in each zone. This system eliminates the human element in controlling carbon potential. It also provides Warner Gear with the necessary close control required for the practical carburizing of gears with near-eutectoid surface carbon concentrations.

Write for Literature H-54-2.

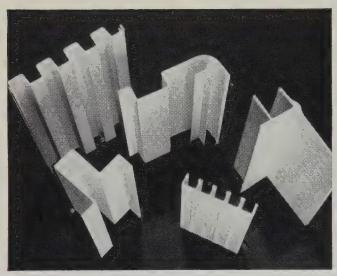


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Service to manufacturers is our business



EXTRUDED SHAPES All standard alloys are available in custom shapes (solid, semi-hollow and hollow), structural, rod and bar, and in extruded tube.



SHEET AND PLATE Supplied as flat sheet, plate, coil sheet, circ in a complete range of alloys, sizes and tempers. Specialty she available on inquiry.

As a basic producer of aluminum, we are in the business of supplying manufacturers of end products.

Therefore, our efforts are put behind the job of serving these manufacturers-and helping them in the solution of their problems.

In recent years, our services have been expanded in order to keep pace with our greatly increased production capacity -which today is close to 30% of all the primary aluminum made in this country.

To give you fast personal service, we have expanded our sales offices to key cities throughout the country.

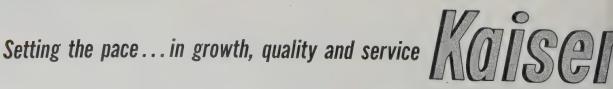
We have expanded our distributor program so that we

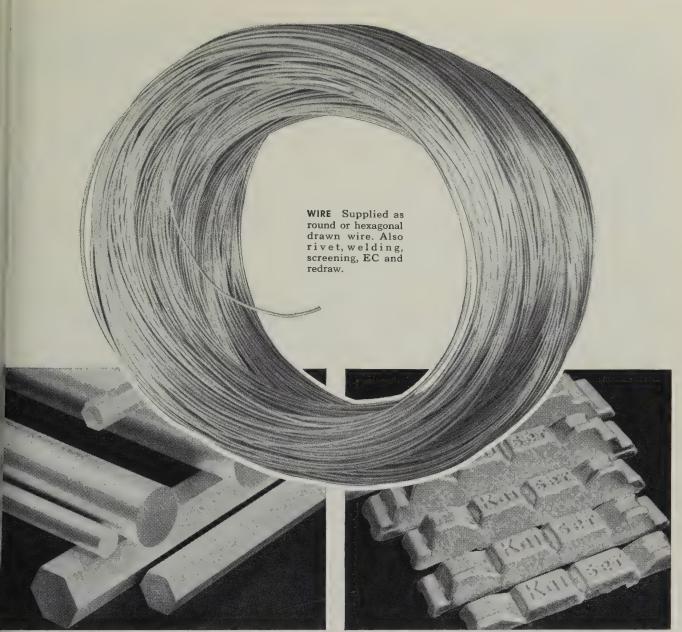
now have a warehouse distributor in almost every major cit

We have increased our sales force and our staff of fie engineers, employing specialists in many fields, such as ro forming, extrusions, conductor, etc.

However, important as these additions are, we b lieve the most significant thing about Kaiser Alum num's service is the attitude behind it. An attitude the moves men to work harder, longer, and with great determination.

We believe that the kind of service we offer-combine with the unsurpassed quality of Kaiser Aluminum-shou be of particular interest to all aluminum fabricators.





ROD AND BAR Available in a wide range of alloys in rolled and cold finished rod and bar, round and hexagonal standard screw machine stock, hexagonal bar, redraw rod, rivet rod and round forging stock, square and rectangular bar.

PIG, INGOT AND BILLETS Kaiser Aluminum produces Pig, Ingot and Extrusion Billets in a range of alloys and sizes to meet your specific requirements.

For complete information, call or write any Kaiser Aluminum sales office or one of our many distributors, located in principal cities. See our catalog in Sweet's Product Design File or write for copy. Kaiser Aluminum & Chemical Sales, Inc., General Sales Office, Palmolive Bldg., Chicago 11, Illinois. Executive Office, Kaiser Bldg., Oakland 12, California.

Other Kaiser Aluminum products include: industrial foil, and electrical conductor. Kaiser Aluminum also supplies household, freezer and broiler foil for home uses; Shade Screening for the building industry and roofing and siding sheet for farm and industrial buildings.





Send for the new PRODUCT DESIGN CATALOG,

containing 24 pages of valuable information on all Kaiser Aluminum Products.

KAISER ALUMINUM & CHEMICAL SALES, INC. Industrial Service Division 5541 Kaiser Bldg., Oakland 12, California

Please send my free copy of the Product Design Catalog.

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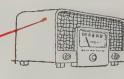
"You can depend on friendly help from Lamson & Sessions"

Lots of people know, and you should too, that Lamson specializes in helping companies solve their Fastener dilemmas. It's all part of the valuable extra service that is automatically yours when you call in the Lamson man.

What's more, your Lamson & Sessions distributor can also arrange factory engineering and advisory service. Just ask him and he'll pass the request on to one of Lamson's five plants.

So if a "how to fasten it" problem has you stumped, and you need quick cooperation, don't hesitate to call on us for help. Possibly you'll find the answer is already in our files.

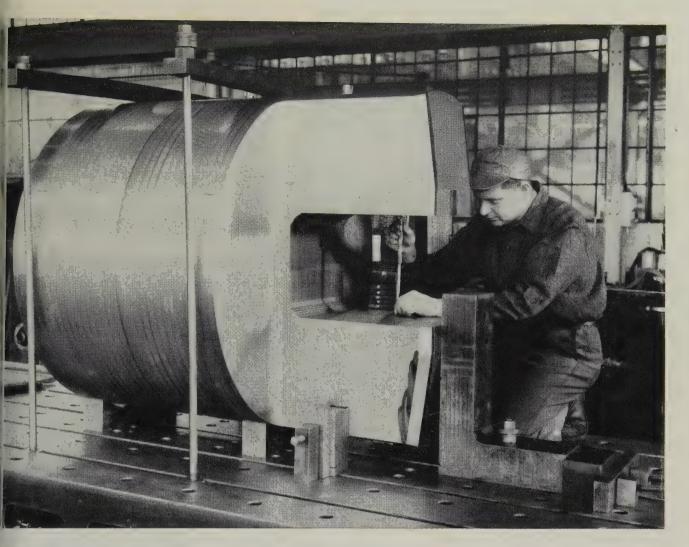
This is another plus service that leads our customers to say: "It's a pleasure to do business with Lamson & Sessions".





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This Forging is made for really HEAVY DUTY-

Transmitting power under constant heavy vibration and sudden severe shock loads is the future in store for this giant mill coupling. It was National Forged as a double with its mating end from a single huge ingot. It is 40-50 carbon steel treated to 72,000 Min. tensile strength with 39,000 elastic limit. This forging and its adjoining coupling are 40" in diameter x 48-1/4" long and weigh 9,800 lbs. each. They are being machined to fractional inch tolerances to keep clearances at a minimum. This care in machining is extremely important to long operational life.

National Forge is equipped to turn out any steel to your exact analysis and finish machine to your exact specifications.

Whether your forging requirements are large or small, simple or intricate . . . try National Forge next time.



Send for your free copy of National Forge's New Bulletin explaining their Operations and Facilities.





The smooth, positive flow of power transmitted through Gates Vulco Ropes enables this large engine lathe to handle quickly and efficiently many tough oil field repair jobs.





Plants all over the world have made this discovery: Gates Vulco Ropes—the V-belts with concave sides—wear longer; cost less per year of service.



Here is the interesting reason why:

When the Gates Vulco Rope is bent around the sheave, the precisely engineered concave

sides (Fig. 1) fill out and become straight (Fig. 1-A). Thus the belt makes full, uniform contact with the sides of the pulley. You get sure pulling power and even distribution of wear.

Longer wear saves not only on replacemen costs; it also saves the cost of down-time ... keeps equipment producing.



It's easy to prove to yourself the value of concave sides



Simply bend a straight-sided belt (Fig 2) and feel the bulge at the sides around the bend. You will quickly see why the bulg

ing sides prevent an even fit in the pulley groove (Fig 2-A). Uneven contact shortens belt life...increases bel

Cut belt replacement time and costs...specify Gate Vulco Ropes—the V-Belt with concave sides (U.S. Pa 1813698). The Gates Rubber Co., Denver, Colorado-World's Largest Maker of V-Belts.

Gates Engineering Offices and Distributor Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

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WEIRTON GALVANIZED

STEEL



Whether it's complicated work for a special purpose or an everyday duct job, there's a Weirton galvanized steel to help you do it quicker—and better. Weirton's close control of quality through every step of the production process is carefully planned—and faithfully executed—to assure a tight coat that forms readily, looks better, and resists both peeling and flaking.

So when the job calls for galvanized steel, call Weirton and be sure. Let their experience serve you and your customers—to your profit.



WEIRTON STEEL COMPANY

Weirton, West Virginia

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YOUR TURNING-TIME CONCEPT

Set it-forget it! That's the story of the Preselector Dyna-Shift. It's the brain Monarch has built into the new Series 62. With it this machine will give a greater ratio of metal removing hours to work hours than you ever dreamed possible.

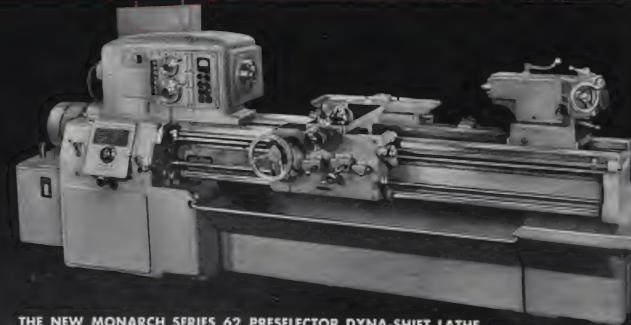
When setting up, merely dial the surface speed wanted and the first diameter to be turned—the Dyna-Shift computes the R.P.M. and makes the shift instantaneously and automatically. (Time-saver #1). Then, to maintain this surface speed on successive diameters, set the work diameter selectors. Every speed change thereafter, on every piece in the run, takes place automatically with but one fast dial setting and movement of the work start and stop lever. (Time-saver #2). What's more, here at last is the lathe with a speed range so wide as to take care of all your needs. Its

20 H.P. drive gives you 36 different spindle speeds in a range from 14 to 1750 R.P.M., a ratio of 1 to 125. (Time-saver #3).

Nor are the time-saving features of the Series 62 limited to the Preselector Dyna-Shift headstock There's four-way power rapid traverse which cuts tool positioning time on the average of 50%. There's the totally enclosed and automatically lubricated gear box and end gearing. There's a completely new two speed tailstock. Add them all up and you get a new lathe concept that means Production with a capital P!

You will want to know all about these and many other features in detail. Send the coupon for the greatest turning news in years!! The Monarch Machine Tool Company, Sidney, Ohio.





THE NEW MONARCH SERIES 62 PRESELECTOR DYNA-SHIFT LATHE

Models 130 and 1130 (above)—13" swing over cross slide, 20" clearance diameter. Models 131 and 1131—16" swing over cross slide, 24" clearance diameter.

RE IN FOR A SHOCK!

See the New Monarch Series 62 <u>Preselector</u> Dyna-Shift —— Unequaled for Speed and Ease





FOR A GOOD TURN FASTER ... TURN TO MONARCH

THE MONARCH MACHINE TOOL COMPANY, Sidney, Ohio Gentlemen:

- I am interested in your Series 62 story. Please send me your illustrated Booklet #1501 with complete data.
- Please have a Monarch sales engineer call on me.

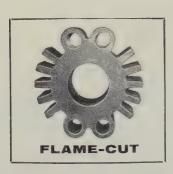
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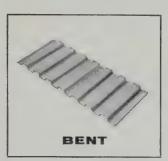
FILL OUT COUPON—and attach to your business letterhead, please



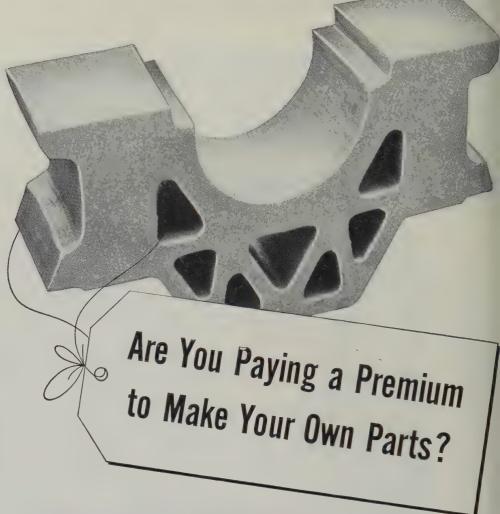












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You can cut production costs—save from 5% to 25% on components—by using By-Products Steel Co.'s Steel Plate Shapes Service to pre-form your parts.

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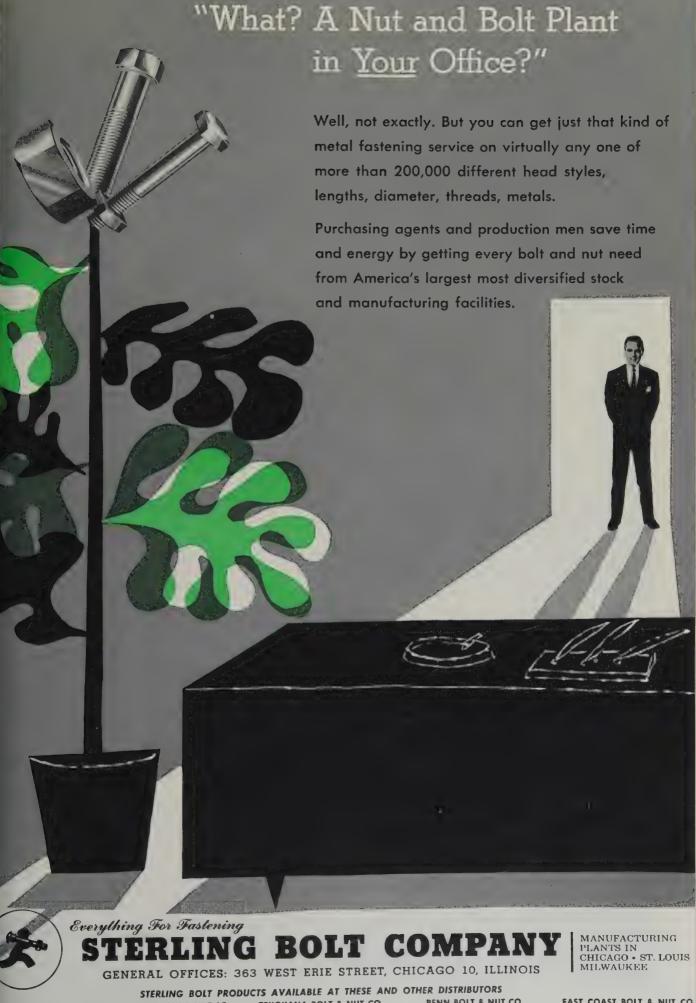
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By-Products can work from plates up to 195" wide or 25" thick in whatever qualities your product requires. Direct access to facilities of the world's leading specialty plate producer speeds product tion, permits great flexibility in forming and heat treating. To find out more about this unique Service, write on your company letterhead for Bulletin 712 Address: By-Products Steel Company 742 Strode Avenue, Coatesville, Penrisylvania.

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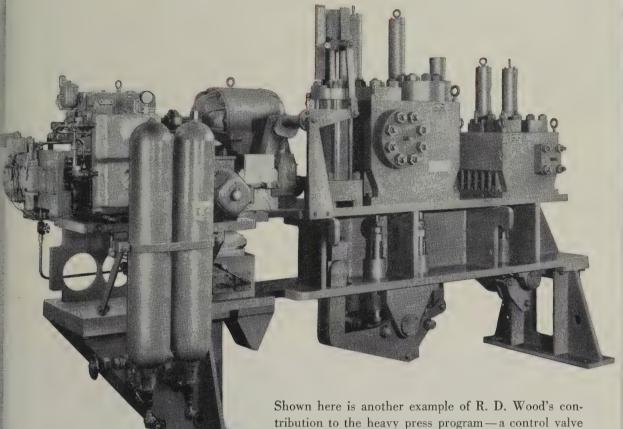
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Big help in heavy press program



Remote electro-hydraulic servo control valve assembly. Length is 14 feet; height 9 feet.

assembly for an 8000-ton forming and forging press. Designed and built by R. D. Wood, it's a highly specialized type. It indicates R. D. Wood's ability to handle the most difficult valve engineering and manufacture.

Other standard R. D. Wood high-pressure hydraulic valves include stop, operating, check, relief, and safety types. Since 1803, the name R. D. Wood has stood for superior products. Write for details on R. D. Wood high pressure hydraulic valves for every purpose.



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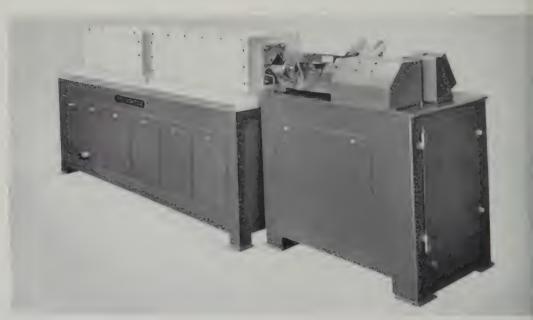




Dual-frequency heating at its best... the equipment shown here (using 60 and 960-cycle power) heats $3\frac{1}{2}$ " R.C.S. steel billets, 8" long, to 2150° forging

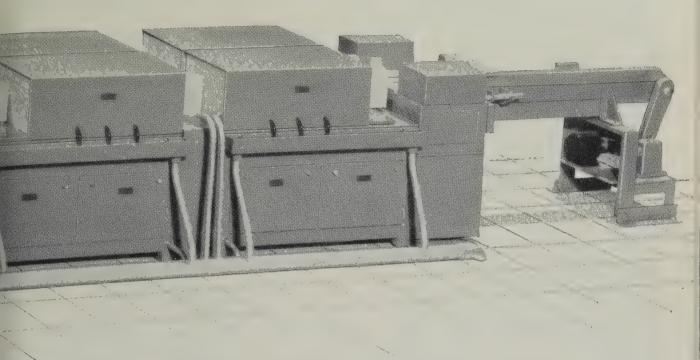
temperature at a rate of 480 an hour. An actuinstallation, using six of these machines, heats tons an hour!





Another outstanding example of Westinghouse dual-frequency induction heating for forging. Clean, cool, and safe, this billet heater takes only 4' x 8' of production floor area. Using dual-

frequency power (60 and 960 cycles) it hea $2\frac{1}{2}$ " diameter, $3\frac{3}{4}$ " steel billets to 2250° forging temperature at a rate of 360 per hour.



Boost forging rate 300%, cut costs 60%...

with Westinghouse induction heating

Based on a recent forging analysis, these figures cell dramatically what savings are being accomplished by Westinghouse induction heating compared to today's "old-fashioned" methods.

How? Here are seven big savings:

- Scale loss reduced to 6/10 of a percent—60 to 80% savings.
- Longer die-life because of low scale.
- Maintenance costs cut 80%.
- Scrap loss practically eliminated.
- Flexible to all production needs—short start-up time; stand-by losses are low or nonexistent.

 Accurate repetitive control of temperature.
- Shearing costs eliminated.
- Pushbutton operation—completely automatic—makes it practical to put forging right in the production line.

Westinghouse ingenuity is the key. Successful nstallations—some with even better savings—crove that two factors are vital to full benefit

of induction heating . . . good equipment and expert application.

Westinghouse offers you a complete, one source service to analyze induction heating for *your* plant. Survey, recommendation, engineering and manufacturing—all by experienced Westinghouse personnel—assure you the proper frequency, power and method of handling to most effectively reduce costs in your plant.

Right now is the time to investigate. You can lead the way to lower break-even points, decreased unit costs—point to extra profit possibilities—by bringing Westinghouse into your forging picture. Call your representative or write: Westinghouse Electric Corporation, H. F. Heating Section, 2519 Wilkens Ave., Baltimore 3, Maryland.

J-02292-B

INDUCTION HEATING FOR HARDENING • JOINING • ANNEALING FORGING • HEAT-TREATING

YOU CAN BE SURE ... IF IT'S Westinghouse





The Philadelphia "Floating" GearMotoR is a new concept for powering steel mill roll tables, conveyors, textile machines and many other industrial drives. This motorized worm gear reducer mounts directly on the driven shaft, and requires no mounting provisions other than a simple torque arm . . . the GearMotoR is supported by the same bearings as the drive shaft, thus the power unit is reduced to its simplest form.

Because the Unit actually "floats" with the driven shaft, there is no problem in providing for and maintaining alignment . . . the power unit and the driven shaft become a simple integral

The "Floating" GearMotoR can be mounted in almost any location, and the use of right angle worm gearing permits the GearMotoR to nestle close to the driven machine, thus saving valuable floor and aisle space. Also, special design and sealing features make it possible to mount it in any desired position — motor horizontal, vertical up or down.

The "Floating" GearMotoR is manufactured in both single and double gear reductions offering a wide range of out-put speeds from 9 to 420 rpm. Motors are available in almost any required combination of electrical characteristics ranging in size from 1 to 15 horsepower.

Proof of the outstanding performance and reliability of the "Floating" GearMotoR lies in the many successful installations throughout the United States and Canada.

Send for Catalog F-54, and be convinced.

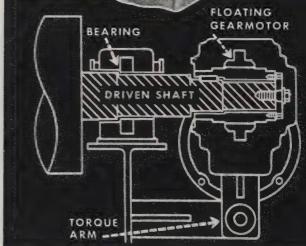


Illustration shows simplicity of assembly and mounting of the "Floating" GearMotoR in the motor-horizontal position.
GearMotoR and driven shaft are supported on same set obearings.

Note compactness of the installation.

PHILADELPHIA GEAR WORKS, INC.

ERIE AVE. & G ST., PHILADELPHIA 34, PA.

NEW YORK - PITTSBURGH - CHICAGO - HOUSTON - LYNCHBURG, VA.

Virginia Gear & Machine Corp. - Lynchburg, Va.



Industrial Gears & Speed Reduct

LimiTorque Valve Controls

Established 1892

why Tool Engineers call these heavy producers,

IOST MODERN MACHINES
THEIR TYPE"

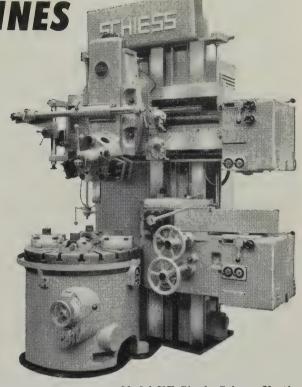
plic pre-selection of speeds set by handwheel and read on ated dial. 16 spindle speeds—ratio 1:50—up to 310 rpm for machining on Model KE 100. Table runs on tapered bearings.

ip control for direction of feed and rapid traverse bring-loaded mono-levers for normal direction plus angular and feeds. Mono-levers move in same direction as I feed or traverse movement, simplify correct setting rator. Specially designed electro-magnetic disc is disengage feed instantly with no over-riding or coasting.

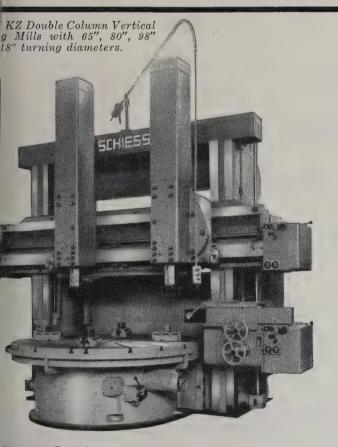
or lowers, and locks cross rail simultaneously by electronical controls. No bolts or nuts to loosen or tighten by hand.

rtical gear drive with main motor mounted on back of ne, directly connected to gear box. Changes in direction of transmitted to table without bevel gears, eliminating on and backlash.

ng attachment with electric tracer for use either on ail or side head.



Model KE Single Column Vertical Turret Lathes with 40", 50" and 65" turning diameters for high-speed carbide machining.



All operating features of KE Series Vertical Turret Lathes are combined in

SCHIESS KZ DOUBLE COLUMN VERTICAL BORING MILLS, PLUS—

Heads equipped with steel octagon rams can be swiveled—have automatic feed in vertical, horizontal and angular direction and are independent of one another as to amounts and direction of feed. Table operated by three-button pendant control. Standard model KZ Double Column Vertical Boring Mills are available with 65″, 80″, 98″ and 118″ turning diameters.

Get to know these products of Europe's largest builder of heavy machine tools. Parts and service are as close as Pittsburgh. An American Schiess engineer will be happy to help you size up these heavy producers for your heavy production needs. Write for catalogs and complete specifications on these and all Schiess KE machines.

ineering Division

AMERICAN

CHIESS

CORPORATION
38th Street and AVRR, Pittsburgh, Pennsylvania

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34 Exchange Place, Jersey City, N. J.



GIVE BACK-UP ROLL NECKS EXTRA PROTECTION

BY USING Texaco Regal Oil in the circulating systems of your roll stands, you'll assure smoother, more dependable operation . . . longer bearing life . . . lower maintenance costs.

Texaco Regal Oil is a high quality, heavy duty oil that affords extra protection because of its high resistance to oxidation, emulsification and sludging, and its ability to separate rapidly from water. This keeps lines clear and bearings clean for trouble-free performance and minimum wear.

For your enclosed reduction gears, use *Texaco Meropa Lubricant*—noted for its EP stability, its resistance to oxidation, thickening and foaming.

Let a Texaco Lubrication Engineer help you improve performance and reduce costs throughout your mill. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.



TEXACO Regal Oils

(HEAVY CIRCULATING OILS)

TUNE IN . . . TEXACO STAR THEATER starring DONALD O'CONNOR or JIMMY DURANTE on television . . . Saturday nights, NBC



Metalworking Outlook

Question and Answer

Question: If there is no auto strike, what will the United Auto Workers do with the \$25-million strike fund being built up through extra dues assessments? Answer: It will be used in an intensive organizational drive aimed primarily at smaller automotive supply firms not now unionized. Betting is still against a work stoppage, although the UAW last week reported "no progress" on the guaranteed wage issue and ordered strike votes at Ford Motor Co. and General Motors Corp. locals. That's a routine move. The two auto companies are adamant against paying the cost of the GAW as figured by the union. The UAW is asking them to put up \$480 million over a five-year period to finance, in part, the wage plan.

Steelworkers Get Set

The United Steelworkers drafted 1955 pay demands last week that they'll present to steel companies late this month. Specifics are hush-hush, as usual, but the increase they want is certain to be sizeable. Negotiations with basic steel firms employing more than 600,000 have a June 30 deadline. Contracts with steel and aluminum processing companies with an additional 600,000 employees expire at varying times from now until year end. GAW won't be an issue this year, but it will be in 1956. Preliminary sparring already goes on. In one of his first speeches as U.S. Steel Corp. chairman, Roger M. Blough said: "Industrial research is the only proved way to guarantee more and better jobs and higher wages."

Slow Year on Tax Laws

This will be a quiet year as far as tax legislation goes. Chairman Jere Cooper (Dem., Tenn.) of the House Ways & Means Committee will postpone indefinitely any action by Congress on the Treasury's 70 recommendations for corrections in the Internal Revenue Code of 1954. Mr. Cooper wants to wait until the Treasury has completed its study of the code, and tackle the changes all at once, not piecemeal.

Powerful Power Potential

Look for capital expenditures of electric utilities to double in the next 15 years. Westinghouse Electric Corp.'s sales vice president, James H. Jewell, predicts an \$8-billion outlay in 1970, compared with about \$4 billion this year. In the next ten years he sees utilities installing capacity to produce and distribute an additional 460 billion kw-hr of electricity.

\$20-Billion Electronics Sales?

The electronics industry will have sales of \$15 billion by 1960 and \$20 billion by 1964. So believes Don G. Mitchell, chairman and president of Sylvania Electric Products Inc. Electronics today comprises 6.3 per cent of all military expenditures. In ten years, he says, that percentage may

Metalworking

Outlook

climb to 10. Defense purchases of electronic equipment by the U.S. will total \$2.5 billion this year and will increase to \$4 billion in ten years.

Standard of Living: High or Low?

To maintain its dynamic pattern of growth, industry must accept the premise that the U.S. has a surprisingly low standard of living. That's the word of General Electric Co.'s W. V. O'Brien, vice president and general manager of the Apparatus Sales Division. He points to the shortage of 370,000 classrooms and the need for 6700 sewage plants as examples of low standards that should be raised.

Oxygen Steel Quality High

McLouth Steel Corp. finds that sheet and strip rolled directly from steel made by the oxygen converter process are comparable or better in quality than material rolled from conventionally produced steel. Forty-four-ton heats are being made in the new converter melt shop at Trenton, Mich.

Coming: Air Cargo Developments

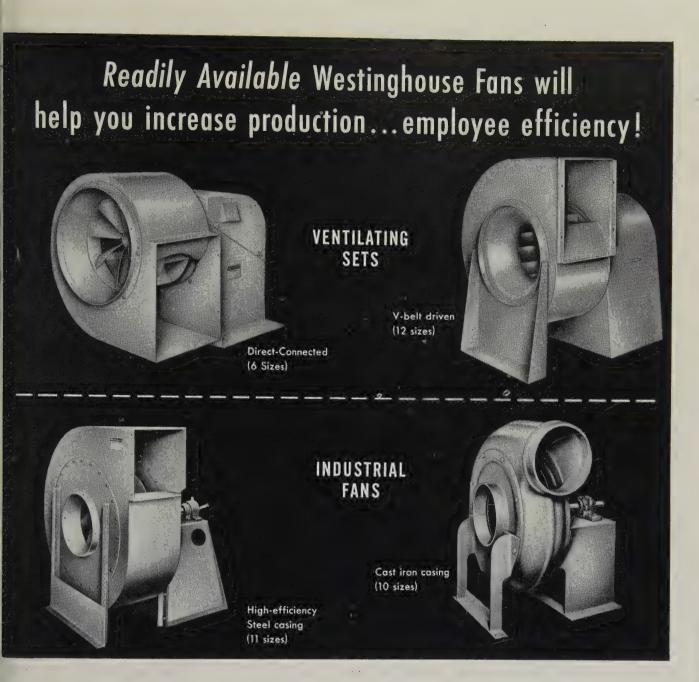
Watch Air Force experiments that may lead to marked developments in civilian air cargo handling. The Air Force is testing an air transportable van that allows unit loading for through shipments. Air Secretary Harold E. Talbott says that more economical air transport of cargo is urgently needed in both military and civilian functions.

Straws in the Wind

The small business share in Atomic Energy Commission procurement has almost doubled since 1951 . . . The General Accounting Office wants to plug several loopholes in present government procurement regulations . . . A record 26,573 pension and profit-sharing plans were in operation at the end of 1954 . . . American Motors Corp. seeks the advice of eight leading economists on whether the guaranteed annual wage would benefit the company; seven of the eight were members of the "public advisory committee" to advise the UAW on the matter in 1953 . . . The Senate Public Works Committee last week rejected the administration's plan to issue \$21 billion in bonds outside the federal debt to help finance a \$30-billion system of interstate highways.

This Week in Metalworking

Expect a brighter spotlight on mergers when the Federal Trade Commission's study on antitrust laws makes its debut soon (page 63)... Target for 1965: A \$500-billion economy (page 64)... Screw machine products companies see better managerial practices leading their old industry to a renaissance (page 65)... Hungry workers: How metalworking solves inplant feeding (p. 66)... New buying under at least one of four government machine tool purchase plans is coming shortly (page 67)... The drive to avoid manual materials handling is the basis for optimism among crane manufacturers (page 68)... Roundup on the heavy press program (pages 69 and 132).



Whatever your air handling problem . . . smoke, fumes, vapor, dust, wood shavings, granular material or ventilating . . . these Westinghouse fans are designed to handle or remove them . . . efficiently and economically.

INDUSTRIAL FANS (Steel Casing) . . . high efficiency for general Air Handling; fume and dust removal; 11 sizes, each with 3 types of wheel for specific applications. Wheel diameters 19" to 64"; inlet diameters 11" to 37".

INDUSTRIAL FANS (Cast Iron Casing) . . . ruggedly built, corrosion resisting. For low volume fume or dust removal, materials conveying, industrial drying and cooling. In 10 sizes, each

with 3 types of wheel for specific applications. Wheel diameters 8" to 34"; inlet diameters 4½" to 18".

VENTILATING SETS (Direct-Connected)...Compact, efficient, ready-to-run. Especially suited for small ventilating installations. Cleanable radial blade wheel minimizes problem of handling airborne dirt and grease. Six sizes. Wheel diameters 6" to 15"; inlet diameters 6" to 14".

VENTILATING SETS (V-belt driven) . . . Self-contained. Install indoors or outdoors in a wide variety of heating, ventilating or air conditioning applications. Twelve sizes. Wheel diameters 9" to 30"; inlet diameters 10" to 32%".

Westinghouse Electric Corporation

WESTINGHOUSE AIR HANDLING

YOU CAN BE SURE ... IF IT'S

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Sturtevant Division, Dept. 14D Hyde Park, Boston 36, Mass.
Please send facts on Industrial Fans and Ventilating Sets.
NAME AND TITLE
COMPANY
CITYSTATE



Why Armco 17-4 PH Stainless Steel cures distortion problems

Here's how Armco 17-4 PH Stainless Steel and standard hardenable stainless steel reacted to heat treatment. The three samples at left are all Type 431 stainless steel; the ones at the right are Armco 17-4 PH. Both sets of discs are of the same dimensions, cut from 11/4" diameter bar stock. All have been heat treated to Rockwell C-40 to C-41.

LOW TEMPERATURE DOES IT

The Armco 17-4 PH samples have only a brown heat-tint discoloration—are perfectly flat, typical of what you may expect in your own plant. The reason is that Armco 17-4 PH is a precipitation-hardening stainless steel. The parts were fully hardened by merely holding at 900 F for 1 hour and air-cooling.

On the other hand, the Type 431 samples had to be heated to 1900 F, quenched, then stress-relieved at 600 F. They are scaled and distorted.

2 PRECIPITATION-HARDENING TYPES

If you are confronted with distortion and scaling in hardening stainless steels, Armco 17-4 PH may solve your problem. It is made in billets, bars and wire only.

For unusually high mechanical properties in sheet strip, plates, and wire, there is a companion grade, Armo 17-7 PH. This grade takes either single or double precip tation-hardening treatment, depending on form and con dition.

SEND FOR INFORMATION

For complete information on the Armco Precipitation Hardening Stainless Steels, just fill out the coupon an mail it to us.

ARMCO STEEL CORPORATION 1095 Curtis Street, Middletown, Ohio	
Send me information on your precipitation-hardening less steels, Armco 17-4 PH and Armco 17-7 PH.	g stain-
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STEEL CORPORATION 1095 CURTIS ST., MIDDLETOWN, OF ARMCO

SHEFFIELD STEEL DIVISION . ARMCO DRAINAGE & METAL PRODUCTS, INC. . ARMCO INTERNATIONAL CORPORATION



May 16, 1955



Toward Better Understanding

Poor communication is the most frequent cause for failure of cost-reduction programs. The people charged with putting the program into effect do not understand its true objectives. Because they have not been fully or properly informed, they tend to become suspicious. The result is quiet, sometimes unintentional, sabotage.

That, in essence, is the comment by a member of Robert Heller & Associates Inc., Cleveland management consultants who have advised many metal-working companies on ways to reduce costs and increase efficiency.

No matter how sound a cost-reduction or other management project may be, it cannot become effective until it is understood by the people affected by it. Literally nothing happens in business until we communicate. Communication is the most important tool we have for getting things done. It is the way we influence others. It is the basis for understanding, for co-operation, for action.

The success of any executive depends more on his ability to communicate than any other skill at his command. Communication likely will take a bigger bite of his work day than any other activity. Unfortunately for him, communication is a job that cannot be delegated. He must cope with it himself. It is his own responsibility. And the higher he climbs the management ladder, the more important is accurate, effective, two-way transmission of information and meaning.

Communication is not simple. There is no easy formula. Even those most expert in the art admit their knowledge and experience is fragmentary and tantalizing. But a number of principles and guides have been developed and tested.

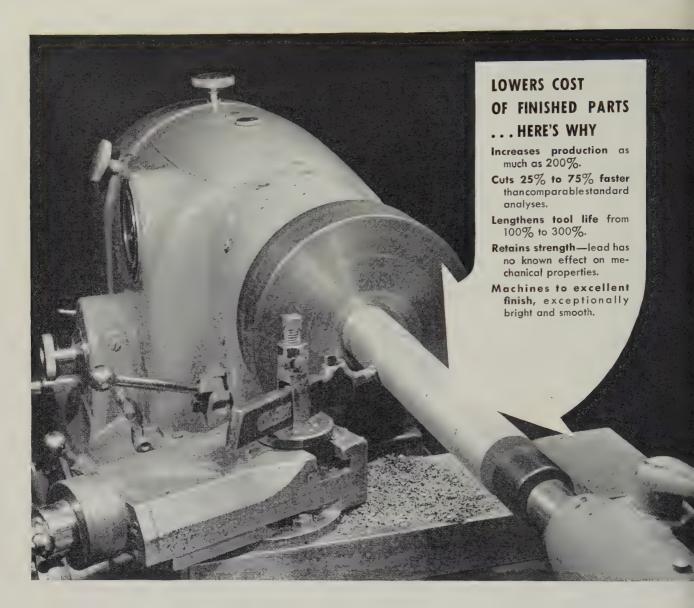
Some helpful practices are presented in the fourth of this magazine's Program for Management on page 103. The hints are designed to improve executive communication and to save time in so doing.

Special targets are the aimless conference, the sterile interview, the non-productive conversation, the long-winded memo and report. If those abuses alone were corrected in your organization, how much time could you save?

Enough to do your job?

Walter J. Campbelf

MANAGING EDITOR



Announcing NEW RYCUT 50, a leaded alloy

fastest machining alloy steel in its carbon range

Here's a medium carbon alloy steel which for the first time combines the high mechanical properties needed in heavy duty applications with the freecutting characteristics of a carbon manganese steel.

Shop after shop has saved up to 75% in machining time, lengthened tool life by as much as 300% and increased production up to 200% after switching from a standard medium-carbon alloy to New Rycut 50.

The secret lies in the addition of a very small amount of lead (.15% to .35%) by a patented process. Finely dispersed, the lead acts as a lubri-

cant between steel and cutting tool—giving greatly increased machinability without known effect on mechanical properties—the hardenability of New Rycut 50 compares with that of AISI 4150.

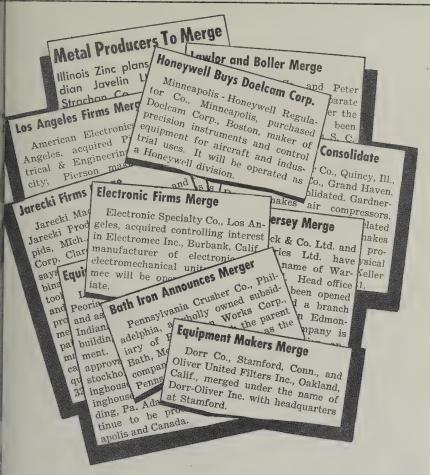
You can get quick shipment of New Rycut 50—annealed or heat treated in rounds of many sizes—from your nearby Ryerson plant. For worthwhile savings, try this remarkable alloy in your shop for production or maintenance applications.

Also on hand at Ryerson—two other leaded alloys: Low carbon Rycut 20 and medium carbon Rycut 40. Also Ledloy, the fastest cutting carbon steel.

Principal products: Bars, structurals, plates, sheets, tubing, alloys, stainless, reinforcing, machinery & tools, etc.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE



nearly comleted antitrust study may mean . . .

TC To Get Tougher on Mergers

ERGERS will be in a brighter obtlight soon—in the next couple weeks, perhaps. Coming up is e Federal Trade Commission's onomic report. Since last Octobr, it has been studying corporate ergers and acquisitions.

Investigations Coming—The reret may touch off investigations mergers and acquisitions of rent origin. Already appointed is task force to look into the most gnificant of them. Appointed by TC Chairman Edward F. Howy, it is a 12-member group of torneys and economic experts of e FTC. Its chairman is Robert. Parrish, FTC secretary. The oup will work under the immedie supervision of FTC's executive rector, Alex Akerman Jr.

Industries most likely to be coved in the report are primary meta, automotive, nonelectrical mainery, chemical, textile, baking, iry and other food products.

Those are the groups in which Chairman Howrey says merger activity of late has been particularly strong.

Not Bad Per Se—Even though a company may be investigated as a result of the forthcoming report, it won't necessarily be prosecuted. Chairman Howrey says: "The 'urge to merge' is neither bad nor good per se. Competition may be injured by some mergers and revitalized by others. Each case must be examined on its individual merits.

"The Congress, the business community and the people are united in wanting fair and vigorous competition, whether it be accomplished by mergers or by their dissolution."

Chairman Howrey feels that the study will enable the commission "to turn the light of fair and considered judgment on those current mergers which threaten fair competition." A good bet: The study will not recommend a get-tough policy, but it will advise a get-tougher approach.

Eye on Steel — Meanwhile, the Department of Justice is keeping its eye on the proposed merger of Youngstown Sheet & Tube Co. into Bethlehem Steel Corp. The department has refused to approve the merger and said it would take legal steps against its consummation. The next move, if there is any, will have to be by the companies, a spokesmen for the Justice department says.

Although mergers have drawn a lot of attention lately, Chairman Howrey doesn't feel the recent wave is as great as some of the earlier ones, explaining: "My own personal speculation is that, taken by itself, and in terms of the relative share of the economy involved, the recent merger wave may not be quite so significant as that of the 1920s, and does not compare with the trust-forming era of 1887-1904."

Different Reasons — Chairman Howrey says it has been suggested that most of today's mergers were initiated by management rather than bankers or financiers. "If so," he says, "this distinguishes the present movement from the former where the so-called trusts were usually put together by bankers who offered securities to the public 'so thoroughly watered' that it took a generation of industrial growth, the inflation of a world war and a nationwide depression to dry them out."

Classifying mergers into three groups (horizontal, vertical and conglomerate), Chairman Howrey says that many acquisitions appear to have been of the conglomerate type—a combination of companies engaged in dissimilar businesses. "This suggests that the desire for product diversification may have been an important motive behind the merger movement," he says.

In the primary metals industry (aside from the proposed Bethlehem-Youngstown merger), the principal acquisitions have been by what might be regarded as medium-sized or even small companies buying up still smaller firms.

For 1956: \$500 Billion Economy

PROJECTED FOR:

Gross National Product

Population Labor Force

Steel Ingot Demand

1955

\$365 billion 165 million 68 million

105-110 million tons

1965

\$500 billion 185-190 million 75 million

150 million tons

THE MEN who advertise and sell the nation's industrial and consumer products are setting their sights on a \$500 billion economy for 1965.

This estimate, based on the assumption that U. S. military preparedness will be maintained at current levels, was presented at a National Industrial Advertisers Association (NIAA) panel session in Washington.

Going Up—Spending for goods and services this year (gross national product or GNP) will reach \$365 billion, a gain of 30 per cent since 1946. In the next ten years, the increase will be an estimated 37 per cent.

Panel members, who "grew up" in advertising and sales work, were: Bennett S. Chapple Jr., assistant executive vice president-commercial, U. S. Steel Corp.; L. S. Hamaker, general managersales, Republic Steel Corp.; J. M. McKibbin, group vice president-consumer products, Westinghouse Electric Corp.; and E. C. Tudor, president, I.D.E.A. Inc., producer of transistor radios and electronic products.

Panel Predictions—To sustain a more dynamic economy, plant and equipment spending will move to 10 or 11 per cent of GNP in 1965. Other capital investments, such as housing, overseas balances and inventories, will remain at about 3 per cent. The government will probably take a smaller "bite of the pie"—dropping from 22 to 18 per cent. Consumer spending will increase to 68 per cent, a 3 per cent rise.

What will cause this expansion? U. S. population in 1965 will be 185 to 190 million. This represents 20 to 25 million more customers. The labor force will in-

crease from its current total of 68 million to some 75 million by 1965. And the long-term $2\frac{1}{2}$ -per cent annual increase in productivity is expected to continue.

Steel Up, Too—Peak demand for steel ingots in 1965 will be 150 million tons, a 35 per cent increase over the record year of 1953. In the next ten years, 10.6 million homes will be built. Electrical appliance sales for the next five years will be 428 million units. Total for the last five years: 353 million units.

Wiring — Installed electric capacity is over 100 million kilowatts. This figure will be doubled by 1965. One problem for electrical expansion is that 25 million homes need new wiring to accommodate the 56 classes of appliances available today. Some 15 years ago, there were only 36 classes of appliances.

NIAA panel members point out that business failures during this expanding period will be traceable to poor planning, insufficient financing and inadequate knowledge of the market.

Product Decline—As an example of what can happen to a market: Almost every home had an orange juice squeezer ten years ago. The average American bought 55 lb of fresh citrus fruit annually. Now he buys only 40 lb. A new product, frozen canned juice, has made the difference. Frozen juice sales have gone from one-tenth of a pound per person to 11 lb each year.

Closer integration of product design, production and marketing will provide business with "insurance." A recent survey reveals that 81 per cent of all the new products developed by 200 companies failed to sell. Reason:

There was a lack of sound m keting information.

Sales Future—The panel poi out that too many advertising a sales managers think in terms a single sale rather than in development of "customers." fective advertising is the air fo of selling. It helps to soften broad section of potential customers.

No Business Dip in Chicago

The April report of the Boness Survey Committee of the Pochasing Agents Association of Cago shows that business in tarea is continuing toward a banyear.

Over-all inventories for month continued to increase. He the association members report delivery slowdowns due to creased business demand: Empl ment reached an all-time high (I than 1 per cent of the compart surveyed reduced their personne

Purchasing agents also are ming out of the hand-to-mouth bracet. They are buying on a 60-to-day or 90-day-and-up basis. Profor April: Some 93 per cent las good as or better profits thin March.

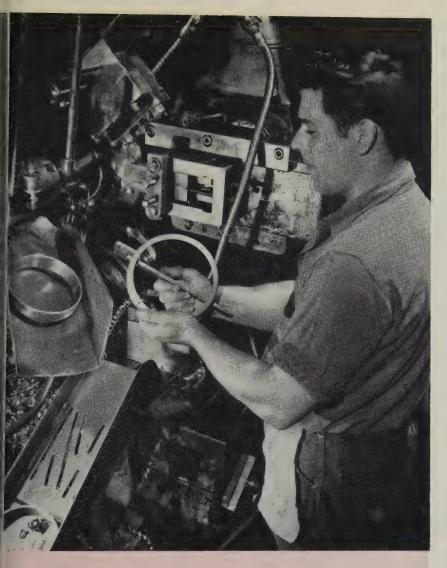
What's a Small Business

The Small Business Administ tion is revamping its definition "small business" as applied to purement. The present policy "any company with less than employees" has been found arbitrary. On May 16, all gove mental agencies interested in purement will be asked to statheir views of what the definit should be. As soon as possil policy will be formulated, present to congressional industrial commutees for comment, then publish in the Federal Register.

Cold Air Men Confer

The Federal Trade Commiss will stage a trade practice of ference for the refrigeration air-conditioning contracting inditry on May 20 in the Press Gall of the LaSalle Hotel, Chicago.

Object: A comprehensive set trade practice rules to elimin unfair methods of competition.



Screw Machine Parts Sales To Climb

 1960*
 \$672 million
 1954
 \$400 million

 1955*
 \$440 million
 1953
 \$600 million

*Estimated by STEEL; source for other figures, National Screw Machine Products Association.

Renaissance in an Old Industry

N INDUSTRY that's taking a ng look at itself is finding a mber picture.

But contract manufacturers of rew machine products believe eir critical self-appraisal is payg off by leading to improved anagerial techniques. They, in rn, can bring a renaissance to an dustry which practiced automaton as long ago as 1873, when the est automatic screw machine was wented.

The View—Orrin B. Werntz, exutive vice president of the Na-

tional Screw Machine Products Association, sketched proof of diffusion in the industry for delegates at the organization's Buffalo convention.

He reported: 2300 companies now, compared with 1200 in 1947; more captive-shop competition now, with 5400 shops operating at least 30,000 screw machines today, compared with 20,000 during World War II; more job-shop capacity, with 22,000 machines now, compared with 17,500 in 1943.

The diffusion has brought a

dramatic slide in the net produced and sold hours per machine in job shops. In 1926-1929, the net was 2140 per year. That fell to 1900 in 1936-1939 and to 1775 in 1946-1949. The slide resulted in a parallel skid in profits—8.6 per cent before taxes in the late 1920s (and no taxes), 7.2 per cent in the late 1930s (and some taxes) and 6.4 per cent in the late 1940s (and plenty of taxes). In terms of 1929 dollars, the average sales volume per company in 1947 was \$113,000, compared with \$380,000 in 1929.

Solutions—In the face of such statistics, what can be done? Plenty, says E. W. Schneider, new president of the association and vice president of Hudson Screw Machine Products Co., Chicago. "It all boils down to better management," he points out. "We are paying more attention to marketing research and selective selling. We are developing more sensitive cost controls, better plant layouts and improved industrial relations."

Those were the subjects concentrated upon in conference sessions at the group's convention. Reviewed was a survey that disclosed 740 different items containing screw machine parts reported by 868 users. The industry has an estimated 20,000 customers.

Silver Lining—Although captive shops are a problem, only 800 of the 5400 have more than 20 employees. Although the number of job shops is a problem, only 400 of the 2300 have more than 20 employees.

"And better management pays off," says Mr. Werntz, "Although our average before-tax profits have dropped to 6.4 per cent, the top 30 per cent of the firms reporting have earnings that average 12.4 per cent. That kind of improved management, plus the natural growth in demand for our products (see table), will be our industry's salvation."

Fruehauf Sales Hit Peak

Roy Fruehauf, president of Fruehauf Trailer Co., Detroit, predicts the test first half in the company's history. Its sales for the first six months will be over \$100 million. Recent orders for 1440 civilian commercial trailers total \$8 million.



Bread and butter approach to labor relations explains . . .

Case of the Missing Lunch Box

"WE'D RATHER have our men leave their salami sandwich at home. The cost of providing a hot meal in the plant is richly repaid in labor harmony."

That's the consensus of bigplant management. Smaller ones are having similar experience.

Why "Inplant?" - One small midwestern auto parts manufacturer daily disgorged its workers into the neighborhood cafes for lunch. For many, lunch included a beer. For some, one beer led to another. Result: Workers frequently returned from lunch late and resumed work with impaired efficiency. Some didn't come back.

Inplant feeding isn't an automatic solution. Poor worker performance often can be traced to

inadequate facilities. That's due to the obvious, but often overlooked, fact that long waits in line, poor food and unpleasant eating conditions deprive workers of much of the renewed vigor which their noon respite should bring.

Helping Hand-Firms like Fred B. Prophet Co., Detroit (its sales have grown from \$6.6 million in 1946 to a high of \$19.6 million in 1953) make a business of giving catering counsel to any company with a food problem. Operating 123 units in 23 states for firms like General Motors Corp., Firestone Tire & Rubber Co. and Westinghouse Electric Corp., Prophet is equipped to foresee your requirements and to set up and operate suitable facilities.

Prophet, and many similar of cerns, tailor their services to needs of the client company. it's a big company, they mi contract for the entire operat assuming all liabilities and tak any profit. For a small compa which has to subsidize the fe ing operation, they often act managers.

Focus-There's little doubt t problems are increasing. One tor is the trend toward plant cation on the outskirts of to Firms which had depended on o side facilities are forced to c with the feeding problem for first time. A second major of tributor is the trend in plant sign toward one-story structu

There are few final answ Workers will not walk more the 800 or 900 feet to a cafete Thompson Products Co., Cle land, and many other large of cerns have been obliged to put additional facilities, one of reasons for the gain in popular of automatic vendors and mo wagons.

Alternatives-Though a wa can't be beaten for cutting wa ing distance, and though vend machines are cheaply moved plant layout is changed, both] sent a problem in plant houseke ing in terms of scattered lit Neither provide the comfort the ready-made meeting hall t you get in a cafeteria.

Fred B. Prophet Co.'s James Rather, director of operation sums up: "Every plant's feed problem is unique and require tailored operation for maxim efficiency. The skills of food m agement are as exacting and c plex as the skills of indust management."

Containers: Big Sheet Users

Steel shipping container mak the nation's second largest us of sheet steel, turned out close 100 million containers and pail 1954. Of the total, 22 million tainers (13 gallons or larg were made in 19-gage (or heav steel; lighter than 20-gage s was used in making 7.7 mil of such containers. Production pails (12 gallon capacity or le totaled 67 million.

ew U.S. Tool Buying To Start

ishington has four programs: For the armed services, for polization-day needs, for elephant tools and for equipant to make marine turbine and reduction gears

Force's \$84-million program to machine tools should be machine tools should be warding will continue until \$10 on to \$12 million worth have ordered by June 30. The resider is scheduled to be ordered mext Dec. 31.

br Emergency—Machine tools bought are those that would heeded in a defense emergency broduce equipment for the Air ce. Some of these tools ally exist but not in numbers exicient for an all-out emergency, the of them would require a cortwo to build; the Air Force to have them on hand, so could go into immediate protion, if needed.

ive different types of machine s have been put into the prom: Skin mills, spar mills, pros, horizontal boring mills and otch presses.

o Aid Builders—The tools probwill not be purchased on the is of lowest bids. An attempt be made to spread the busis across the board.

he Navy and the Army also buying machine tools under program. The Navy has apximately \$14.5 million, some of the already has been committed. It expects to commit the rest Dec. 31. The Army's portion this program is \$1.5 million.

More Coming—If the services do use all the \$100 million this r, they will put the unused porinto another fund which can spent in future years. It is pected that every effort will be de to commit all or most of this, it affect the proposed \$100-lion package for 1956.

Three other machine tool proums are being studied: 1. The rine turbine and reduction gear inding-out component program about \$64 million. 2. An overmachine tool industry program sed upon Defense department rerements. 3. The elephant or long lead-time tool purchase program.

Action Ahead—Of the \$64 million in the marine turbine and reduction gear program, about \$45 million will be for machine tools and the rest for plant facilities. Dr. Arthur S. Flemming, Defense Mobilization director, promised that he will take action on this program immediately after he appears before Congress for extension of the Defense Production Act.

The over-all machine tool industry program, which is designed to cover mobilization-day machine tool requirements of the Defense department and a portion of the defense-supporting industry, would require more than \$1.8 billion worth of tools. Only a portion of these would be bought immediately; a further look at needs would be taken a year hence.

Elephants — Tools in the elephant program are those primarily for defense-supporting industries and are larger than those required by the Defense department and normal defense suppliers. Approximately \$72 million worth of tools are in this program submitted to Dr. Flemming. The Metalworking Equipment Division of the Business & Defense Services Administration recommended that the elephant tool program be implemented now and in the full amount.

Allis-Chalmers Expands

Allis-Chalmers Mfg. Co. will spend about \$10 million this year for capital expansion. Robert S. Stevenson, president, said most of the money is for electrical and construction equipment operations.

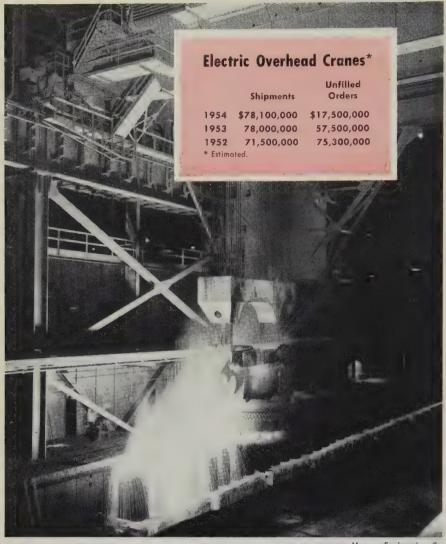
Ford Builds in England

Ford Motor Co. Ltd., will spend over \$168 million to expand its production facilities. To meet an expected increase in demand, construction will include a new foundry, press shop and assembly buildings at Ford's Dagenham, England, plant.



Special Gondola Car Handles Six 72-in. Coils

The Nickel Plate Railroad says "Coil Cars" have these advantages: Larger shipments are handled, loading and unloading time and expense are reduced, individual wrapping of coils is eliminated, blocking and dunnage are not needed and damage is minimized. Three of them are in service, and 25 more are being equipped with required skids and special equipment. They have a load capacity of about 140,000 lb of steel coils. A tarpaulin covers them



Morgan Engineering Co.

Sparked by renewed capital equipment spending . . .

Overhead Crane Prospects Pick Up

SIX MONTHS ago, business was getting uncomfortably off balance for overhead crane makers. To keep sales running at 1953 levels, the industry had to cut order backlogs below a safe level (see table).

Makers say they need at least six months in firm orders to stay healthy. By the end of 1954, backlogs were under three months, but inquiries started taking a turn for

Going Up-The acceleration carried through into this year. Helped by new tax depreciation schedules, more capital spending plans are being finalized, and many of the earlier inquiries are firming into

Robert F. Rice, Whiting Corp.,

Harvey, Ill., says: "Inquiries have been coming in at the highest rate since the early months of 1953. While many of them are doubtless for long-range planning, crane business should be much higher than it was during most of 1954."

Confirmation - W. H. Morgan Jr., president, Morgan Engineering Co., Alliance, O., remarks: "Potential business looks better than at any time in the last three years." A spot check of other manufacturers (there are over 30 in the industry) bears him out. Most see some betterment in store.

Buying in volume are steel producers (which usually head up the customer list), automakers, public utilities, mining companies, metal fabricators and electrical equi ment makers. Aluminum, gla and petroleum people also are di ging in their pockets again.

Exports-Some increase in fo eign sales is anticipated this ye as trade to South America as Mexico picks up. Last year, cra exports accounted for about 5 p cent of total sales, down son from recent yearly averages. E clid Crane & Hoist Co., Clevelan selling through distributors, es mates foreign sales at 10 per ce of its total.

Industry Problems-One lea ing maker feels the big proble is to produce a satisfactory craat lower cost. Potential custor ers, he adds, are more price-so scious than ever before. Anoth maker reports: "The eternal pro lem is tailoring cranes to meet the individual requirements of cu tomers."

Designwise, more welded co struction and increased use of a loy steels are tending to redu average crane weight, says Ha nischfeger Corp.'s F. M. Blum. B extra features that are being ad ed as buyer inducements-ma netic controls, more safety pla forms, more guard railing-ter to increase total weight.

Bustling activity in electr hoists and monorail equipment helping clear up much of the bus ness uncertainty. Some make expect gains this year of as muas 15 per cent, reflecting substa tial modernization of plant faci ties, as well as building expansic

Bearding the Giants

The only foreign auto plant compete with the U.S. industry its own ground will be set up 1 Daimler-Benz in the U.S. by the year end.

The 75-year old German con pany had sales of \$240 million la year. It already has plants in other countries outside German and is currently exporting sor cars into the U.S. Carl F. Gies director, reports: The company formed in partnership with sever American companies, will known as Daimler-Benz of Nor America Inc. Initial annual pr duction will be a "few thousan trucks and busses.

F Gets Its Presses

Aream in 1951, the Air Force Heavy Press Program is coming a reality. AF officials are eying plans for more is and a 75,000-ton forge unit

FALL, the Air Force Heavy s Program will be completed. st development: Harold E. bott, secretary of the Air Force, Kaiser Aluminum & Chemicorp. will operate a new government-owned extrusion plant at bethorpe, Md.

raiser, which operates a plant Ment to the site picked for the usion plant, was given the asement originally. Then the ject was opened to competitive ling. Other bidders were Reyls Metals Co. and Harvey Male Co. To be completed by fall, integrated plant will be pped with two 8000-ton sses.

tetter Break—The AF discloses the new contract is on terms betantially more favorable to government than was original—expected." By seeking competible to a five-year basis, the reports that it will receive ner rent, guaranteed annual minum rentals and agreements add facilities and absorb ab-

normal as well as routine maintenance.

Of the ten presses (four forging and six extrusion) in the program started by the AF in April, 1951, three forging and two extrusion presses are in operation (see table on page 132). The largest closed die forging press until early this year was an 18,000-ton unit leased by the AF to Wyman-Gordon Co.

Total Price — Over-all expenditure for the program is estimated at \$279 million. This includes presses, facilities and supporting costs (transportation and industry expansion). Example of supporting cost: Some \$676,000 was spent moving machine tools into Midvale Steel Co.

Press Future—Aircraft designers already have submitted plans to the AF. They call on the forging presses to make cargo floor bulkheads, cockpit floor beams, landing gear supports and bulkheads, fire walls and engine mounts.

The aircraft industry also will

have to design many other parts for the forging presses. Initially, the 35,000 and 50,000-ton units will turn out parts for a fighter plane and a jet tanker. It is hoped that in time they will be able to produce parts for transportation and other civilian industries.

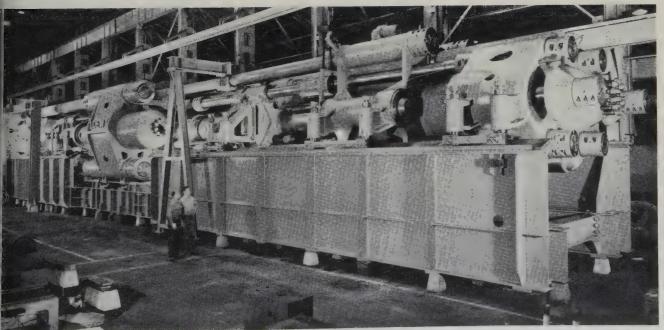
Interest Rekindled—The AF still is interested in at least two presses from the old program (it called for 17 presses instead of 10). Meetings are being held between the Air Materiel Command and Aluminum Co. of America to talk over a 20,000-ton extrusion press. Chances are, if the 50,000-ton forging unit proves its worth, talks will resume on a 75,000-ton model.

"Considering that we in the U.S. have no experience to call upon in a press program of this magnitude, we are making progress at an ever-increasing rate," states Secretary Talbott.

Stockpiling—Not Enough

"A changed emphasis in national stockpiling policy is required to assure continuity of essential production . . ." after an atomic bomb attack, states the National Planning Association, Washington.

It says the current stockpiling of critical materials suits only one possibility, a long war of attrition in which neither side uses nuclear weapons.



Nordberg Engineering Co.

An 8000-ton extrusion press designed by Loewy and built by Nordberg



SEC Plugs for Midyear Report

COMPANIES whose stock is listed on any of the country's exchanges may have to make reports twice a year (rather than once) to the Securities & Exchange Commission.

The commission believes this would be of considerable help to investors.

Outlook—The additional report would have to be filed within 45 days after the end of the first half of a company's fiscal year. These companies now file a report after the close of their fiscal year.

The proposed midyear report

would contain specified information about sales and gross revenues, net income before and after taxes, extraordinary and special items and charges and credits to earned surplus. It would not call for a formal statement of profit and loss and earned surplus or require certification.

Review — Quarterly statements once were required by the SEC, but they were discontinued in late 1953. Hearings have been held on the proposal for twice-a-year reporting and studies are continuing.

Rails Ask Rate Relief

The Chesapeake & Ohio Railway applied to the Interstate Commerce Commission for relief on freight rates on carloads of blast furnace coke from Ashland, Ky., to Hammond, Ind., Chicago and points in the Chicago district in Illinois and Indiana. The application was on behalf of the C&O and the Elgin, Joliet & Eastern Railway. They cited competition as the cause for the application.

Tooling for Defense

A program that would ready the gage, cutting tool and tool and die industries for defense mobilization is being started in the Metalworking Equipment section of the Business & Defense Services Administration.

Heading up that program is Albert F. Polk, a vice president of Sheffield Corp., Dayton, O., who just started an assignment in Washington.

Until now, the BDSA Metalworking Equipment section has concentrated mainly on machine tool needs for an emergency. Now that the work is well in hand, the section is giving increased attention to other segments of the metalworking equipment industry.

Washington Whispers

The House Appropriations Committee told the Eisenhower administration to consult with Congress

before it transfers any more go ernmental functions to private dustry . . . Spencer S. Shann of Bedford, Pa., is the new dir tor of the Office of Minerals Mob zation, Department of Interior. A Bureau of Mines report sa locally available materials can used to produce pig irons meeti the needs of the foundry indust of the Pacific Northwest . . . Ber lehem Steel Co.'s shipbuilding di sion was authorized by the Fede. Maritime Board to convert for Mariner ships into vessels to me trade needs of the American Pre dent Lines' round-the-world ser ice . . . The Federal Power Co mission reports the rate for co bustion of coal for production electrical energy in the U. dropped to an all-time low of 0, lb per kw-hr in March . . . Mo than 100 pieces of equipment ma by 97 American manufacturers a on display at the joint U.S. dustry-Government central exhi at the First Tokyo Internation Trade Fair.



Meet Thomas Moore: He's to Business & Defense Services A ministration's new director for it and steel. He comes to Washington Brainard Steel Division, Stron Steel Corp., where he was go neral manager. His industrial bacground: Steel warehousing a sales. During the war, he rose lieutenant colonel with the Onance Corps. He can be reached Washington at Sterling 3-92 Ext. 4412.



HE Automotive and Appliance industries have long been aware of product improvement due to Flex Roll Processing. Low carbon steel as supplied by the steel mills for deep drawn parts, requires a cold working prior to the press operation, to eliminate stretcher strain, improve surface appearance and minimize scrap losses.

The new McKay Flex Roll Processor combines thorough cleaning with efficient filtering of cleaning fluid and effective cold

THE McKAY MACHINE COMPANY YOUNGSTOWN, OHIO

working of the steel sheet to prepare it for severe deep draws.

McKay engineers will appreciate the opportunity of demonstrating the benefits of Flex Roll Processing.



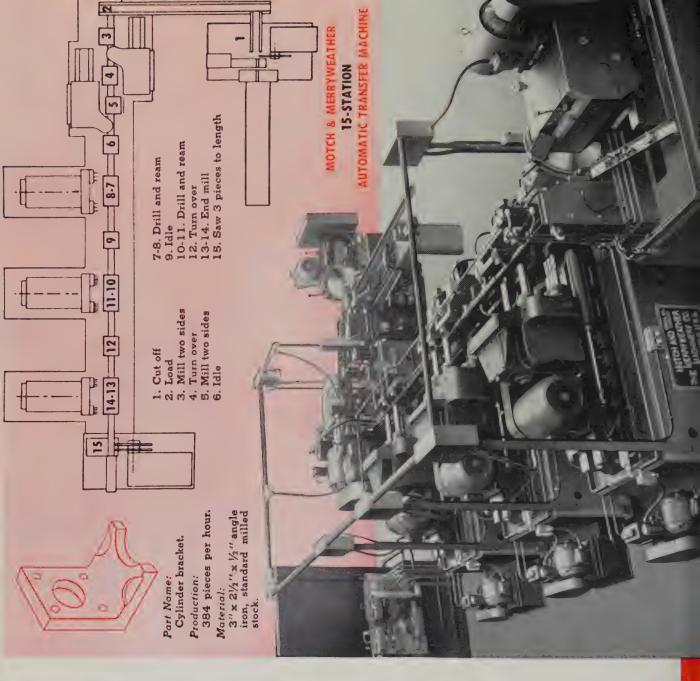
MOTCH & MERRYWEATHER



A variety of machining operations, unique in sequence, is combined on a new 15-station automatic transfer machine. Grouping standard machine tool units attains maximum production and utilizes automation. In addition, the M. & M. Triple-Chip circular saw cut-off makes possible the use of low cost stock material; increases your ultimate savings. Start by sending us your part drawings for a production solution by Motch & Merryweather.

MOTCH & MERRYWEATHER MACHINERY CO.

MACHINERY MANUFACTURING DIVISION CLEVELAND 13, OHIO



Management at Work





Design for Maintenance, Says Cross' Tech

"TECH certainly is at home in engineering," fellow students used to pun about Kurt O. Tech.

Now vice president-engineering at Cross Co., Detroit, Mr. Tech recalls with a smile that he joined the firm as a drill press operator in 1940. It was shortly after he was graduated from high school . . . "the job permitted me to enroll in night school at Lawrence Tech," he explains.

Forerunner—Two years later he was designing machine tools. He continued in night school, completing his B.S. degree in mechanical engineering in 1948.

"My first big job was working on the design of a shell lathe during the war," reminisces Mr. Tech. "Development of a hydraulic handling device made that machine a forerunner of the automated equipment we build today."

Creative—Kurt Tech observes: "During the war, we were too busy building equipment to spend much time developing the ideas we had." By 1946 the company was in a position to concentrate on creative work again, and he was made chief engineer, a job concerned directly with the design of machine components.

In earlier days, Cross Co. built mostly standard machines with adaptations for specialties. Today, most are built for a specific job. To keep costs down and make maintenance easier, the equipment is designed around standard components as much as possible. That has meant a complete revision of standard components

since 1945. New equipment developments are continually checked for possible savings in space or equipment operation.

Theme—"The concept we follow is to design for maintenance," Mr. Tech points out. "Earlier attempts at automation often required dismantling the entire machine just to change an oil seal. Hydraulic valves were inside a machine where it was assumed they would be safe. They were safe all right, but maintaining them was a big job.

"Wherever possible we now mount our valves away from the machine, generally on hydraulic power units. They are out of harm's way and by keeping them in small groups, we haven't increased our piping runs much. A hydraulic valve can be removed in 1 minute, a hydraulic cylinder in 5."

Significance—Though most people are impressed with the size of automated equipment, the successful engineer is the one who can retain the concept of the unit without losing the significance of small details, believes Mr. Tech.

To facilitate this approach, Cross Co. has a big engineering staff. Totaling seven when Mr. Tech started with the company, it now boasts 100 people. It's divided into three divisions. The first, working with sales, deals with the preparation of proposals to the customer; the second, with productive engineering; the third, with future development engineering.

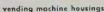
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a new vinyl-to-metal laminating process that gives sheet metal products all these advantages...

- lasting protection against rust and corrosion
- practically any surface effect desired
- superior abrasion resistance
- outstanding resistance to perspiration and most chemicals
- uniform coverage of almost any thickness
- good sound-deadening properties
- less costly fabrication









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business machine housings



air conditioner cabinets

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What's more, the vinyl surface would always be warm and pleasant to the touch. Marvibonding ends problems of

rust from moisture condensation. And it helps to deaden sound, as well as insulate against squeaks from metal to metal contact.

Why not Marvibonded panels and trim! Plenty of excellent reasons why. Excellent reasons why for hundreds of similar applications-like radio and television housings, business machine covers, vending machines, air conditioners, waste baskets, and many many more.

Better see what Marvibond can mean to your product! Write the address below today.

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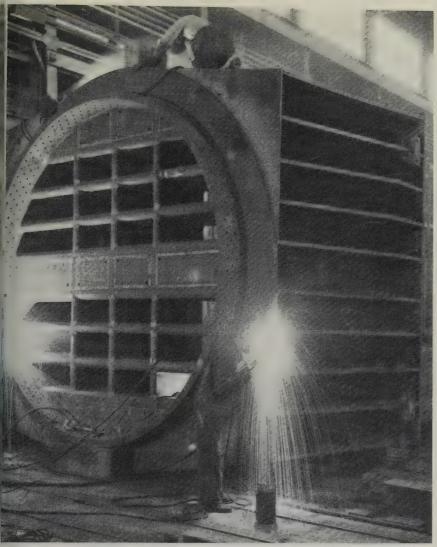


Naugatuck Chemical

Division of United States Rubber Company Naugatuck, Connecticut



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Consolidated Western Steel Corp.

Veldment Sales: Getting Hotter

ELDMENT INDUSTRY'S outok: Business is "hectically" good r some, just getting under way r others.

Louis T. Kenney, vice president d general manager, United elding Co., Middletown, O., rests that first quarter sales interested 27 per cent over the corresponding period a year ago. Lited's weldment activity is cented on machinery and presserts, pressure vessels, diesel enter crankcases and parts and Linless steel bases. The commy handles weldments up to 50 as.

Owned and Unowned — Comnies making weldments are in o main categories—captive and o. Frequently a company is th. The U. S. has several hundred medium-sized shops and innumerable small units, and almost every structural steel and plate fabricator makes some weldments, but only 10 or 12 commercial weldment producers gross \$100 million.

Beginning Slow — Some manufacturers are still struggling to get a start. R. C. Mahon Co., Detroit, whose production is concentrated on machine tools and heavy machinery, made 20 per cent fewer sales in the first quarter of this year than it did in the same quarter last year. Its estimate for '55: Sales are picking up and will continue to do so.

Weldments range from a few pounds to several tons. Shops turning out large units must use heavy handling equipment—

cranes, bending rolls, shears, welding positioners, etc. Weldments can be done as special jobs or in production runs. For long runs, jigs and fixtures are used for economy.

Other applications for weldments include: Printing presses, earth-moving equipment, locomotives, mining machinery and gear blanks. Many weldments involve a combination of castings and rolled or wrought steel.

Optimistic — William Pearse, general sales manager, Lewis Welding & Engineering Corp., Bedford, O., says: "Our first quarter was 30 per cent better than the first quarter a year ago. I feel that we will do 50 per cent better this year than last. While inventories are normal for our average rate of business over the last two years, a 50 per cent increase in this year's sales will put steel on the critical list. Deliveries already have tightened from 6 to 12 or 14 weeks."

Lewis does weldment work on basic frames for machine tools, special machinery, materials handling equipment and off-the-road truck units. The firm has a new government contract which will add to total sales, but the military work is not being included in the sales estimates or percentage increases for the year.

While most producers do not have defense contracts now, the industry is still "welding the seam" on one of its best sales years.

Congress Eyes Automation

A congressional joint economic subcommittee, headed by Rep. Wright Patman (Dem., Tex.), plans to study problems arising out of the trend toward automation.

Mr. Patman believes there may be "important impacts upon levels and stability of employment as well as upon plant and equipment expenditures and consumption potentials."

The subcommittee, which will be helped by Labor department case studies, will cover such subjects as displacement of workers, new investment needs and added products for consumption. Automation experts from industry will participate in the panel discussions.

NOW IS THE TIME... and here is the way!

To Reduce Manufacturing Costs with a . . .

This revolutionary new design of vertical turret lathe has exclusive features never before of-

fered on machines of this type ... takes full advantage of the latest improvements in cutting tools and methods ... truly the machine with a "built-in" future.

PENDANT CONTROL . . .

provides maximum machine control from a movable pendant station. Start and stop spindle; selection of speeds, feeds and directional movement of all heads in feed or traverse are quickly and easily accomplished from the Pendant. Interlocks and a stopall stick provide safety for both operator and machine.

SCREW FEED . .

is provided for vertical and horizontal motion of all heads—to assure fine, smooth finishes with greater accuracy.

POWER INDEXED MAIN THRRET

(Optional) Five sided turret for "run of the mill" jobs. Four sided turret for production jobs,

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Model 75

AVAILABLE IN 26, 36, 46, 56, 66, AND 76 INCH SIZES

WE INVITE YOUR INQUIRIES - CALL OF WRITE YOUR NEAREST BULLARD SALES OFFICE, DISTRIBUTOR OF

THE BULLARD COMPANY BRIDGEPORT 2, CONNECTICUT



the works are engine air cleaners, one of AC's many products

M's AC Division Gets Around

EVERY CAR AND TRUCK made the United States today has at list one AC product on it."

That's the claim of AC Spark up Division of General Motors orp, which also produces such tomotive garnishments as oil ters, fuel pumps, air cleaners, tencers, radiator caps, gasoline of oil strainers, gages, flexible lafts, speedometers and instruent panels. All this, of course, exclusive of such electronic milary items as gun-bomb-rocket ghts, navigational computing systems for bombing and an electonic fire control system.

History—To understand the evotion of GM's you-name-it divion, one must go back to 1908 hen a French motorcycle and atomobile racer decided to risk s neck in the sport of business manufacturing spark plugs. his chap, Albert Champion, enlisted the aid of such worthies as W. C. Durant in founding his Champion Ignition Co. Durant at the time was in control of Buick Motor Car Co. and hoped for a responsible source of spark plugs.

To get into production quickly, a second-floor room in the Buick plant was set aside for the machining and threading of the steel shells and gland nuts which were assembled with insulators imported from France to form the spark plug. Growth of the auto industry quickly increased the employment over the original crew of 15 men. During World War I, AC developed an aircraft spark plug which reached a volume of 50,000 plugs a day by war's end.

Growth — Following the war, AC expanded its activities by entering the speedometer business, the first of some 30 additional major products which have led to its

claim: The largest automotive accessory producer in the world today. Typical are such nuggets as air cleaners, which the company put into production in 1925. The next year it added diecastings, oil filters and gasoline strainers.

In 1927, AC began to manufacture its fuel pump, and for many years it built the world's output a fairly hefty sort of chore in itself. Also in 1927, the full line of instruments was started. Added to the speedometer were ammeters, oil pressure gages, water temperature gages and an almost forgotten device in passenger cars, the tachometer, to indicate engine revolutions per minute. In 1928, AC began building complete instrument panels and the same year started making breathers for crankcases.

Into the Family—With a finger in too many pies to be ignored, AC became a division of General Motors Corp. in December, 1929, just one month after Harlow H. Curtice, its general manager until 1933, took

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over. Someplace along the line, Albert Champion had hopped a fast horseless carriage to Toledo, O., and started a deal called Champion Spark Plug Co., which continues to offer unfraternal competition to Al's first born.

During World War II, in addition to aircraft spark plugs, AC with its instrument-making experience was a natural to go into such devices as automatic pilots, bomb-sights, special instruments and instrument panels, as well as the .50 caliber Browning machine gun. At the peak of war production, AC employed more than 19,000 men and women, and was just getting back to peacetime operations when Korea came along.

Into Electronics-To handle the production of the huge navigational computer for bombing, which it was assigned because of its experience in electronics, the division acquired a plant in Mil-Today, the electronics waukee. work continues to be important in the scope of the operations, with a present development pointed toward improved fire control and guidance equipment. On the production side, the Milwaukee plant also is turning out variable pitch blades for the Buick Dynaflow transmission, along with gun-bombrocket sights and bombing-navigational computers.

But to return to the automotive end of things. Keeping pace with the equipment needs of GM's better than 300,000 units a month currently occupies the time of a major portion of the division's 17,000 men and women. That employment, incidentally, is larger than some of the car-producing divisions of General Motors. A typical example of production at AC is the air cleaner which the division supplies for all the GM lines.

Growing—Functionally called intake silencers, these are the units conceived as the engine by many housewives owing to their prominence. The size of air cleaners has grown to such an extent that AC's heavy volume today is in 11 to 16-in.-diameter units, compared with 8 or 10-in. units only a few years ago. Increasing in complexity as well, these units have inspired much ingenuity on the part of AC production engineers.

Seven press lines of five presses

each have been arranged with a combination of slides and portable conveyors to carry the parts from one operator to the next for blanking, forming, trimming, flanging, etc. As the press operations are completed each part drops onto a central conveyor which carries the various parts to a washer. They are run through the washers on edge to minimize damage. On emergence, they are put into bins for storage or hung on a conveyor for transportation to the assembly area.

Conveyorized — To permit air cleaners to be run in lots rather than in continuous production and to give flexibility for model changes, portable conveyor units are used extensively in the assembly area. Girls remove the parts from the conveyor which also functions as a storage point. They spot weld the parts together, using portable welding fixtures. Now creeping into the line, incidentally, are welders with rollers for a continuous weld which eliminates the need for crimping.

After top and bottom assemblies have been finished on parallel lines, the units are put together on a machine which closes the lock seam on the bottom section, trims and rolls the edge of the top section

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,530	574,215
March	955,027	672,858
April	936,994†	676,269
May		621,262
June		623,732
July		543,540
August		523,799
September		364,441
October		312,078
November		616,395
December		761,954
Total		6,885,010
		-,3,020
Week Ended	1955	1954
A mm O	907 000	4 20 000

Week Ended	1999	1954
Apr. 9	207,089	152,086
Apr. 16	218,078	148,559
Apr. 23	225,074	157,710
Apr. 30	231,021	159,206
May 7	220,961†	154,640
May 14	217,500*	153,796

Source: Ward's Automotive Reports. †Preliminary. *Estimated by STEEL.

and drives the wing nut automa cally. The clamp is then welded the bottom of the air cleaner, a the units are painted and pack ready for shipment.

Sidelight—One interesting sidelight is the fact that AC makes own wire mesh for Buick air clears. Fed from spools, the 0.009-wire travels through a series gears which flatten and crimp emerging to be wound on reels to size of an air cleaner. Also of noise a new 900-ton press which utizes a progressive die to turn a major air cleaner stamping in to steps and eight working station eliminating the already well med anized interpress transfer of particular and stational statio

But you find ingenuity in t manufacture of other AC produc as well. For example, you'll fi a power-and-free conveyor syste in the instrument assembly depa ment. Multitiered trays are load with subassemblies in other depa ments and the destination of t unit is indicated by a dial contr ling an eight-position electrical sy tem in the power-and-free u head. The tray then travels au matically along the conveyor the proper assembly area who it waits until the parts are quired. An interesting feature the hydraulic mechanism incorp rated in the unit which makes possible for the girls assembli the units to raise or lower the tr as required to reach the parts.

Facet—Interesting, too, are op ations in the oil filter and fil cartridge departments. The placement "can" is formed from pre-enameled coiled stock on "can" forming machine after blan ing on a press, which puts in t holes and cuts off the rectang required. Meanwhile, a resin-i pregnated, paper-like strip is bei formed into a tube with a bond seam and crimped into an cordion-like bellows about 2 ft lo on another machine. The metal t and bottom of the "can" are bot ed onto the accordion, and the u is then assembled in another ca factory-type machine and carr to a last machine which folds box, drops in the instructions a closes the box automatically.

So much for a smattering of A Spark Plug Division, General M tors Corp., which in all proability built part of your car.



which tool cut leaded steel?

• Right! The answer could only be Tool A which was used on leaded Aristoloy—4140. Tool B was used on non-leaded Aristoloy 4140 under the same conditions.

A comparison of the cutting edges of both tools demonstrates how the freer machining characteristics of leaded steels increase tool life and thereby reduce machining costs. The lead addition acts as a lubricant reducing friction between chip and tool. Tools therefore operate at lower temperature, contribute to better chip formation and eliminate damaging tool edge build-up.

Why not find out what advantages leaded steel can offer you? Call your nearest Copperweld office today for complete information or write us direct.

SEND FOR FREE CATALOG

If you would like specific information about application of lead steel to your product get in touch with your nearest Copperweld office or write us today.





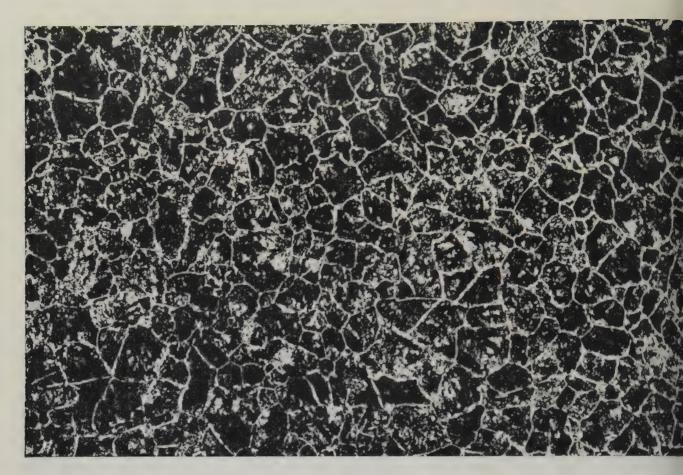
COPPERWELD STEEL COMPANY

STEEL DIVISION . WARREN, OHIO

For export—Copperweld Steel International Company, 117 Liberty St., New York

DISTRICT OFFICES

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See for yourself why TIMKEN® forging steels give you uniform, high quality forgings

NOTE the uniform grain size in this photomicrograph of Timken® forging steel. We examine every heat of Timken forging steel—spectrographically to assure uniform grain size. As a result, you can be sure that forgings made from Timken forging steels will give you uniformly high ductility and resistance to impact.

Because your order of Timken forging steel is handled individually in our mill we are able to target our conditioning procedure to your particular forging requirements. That minimizes your rejects.

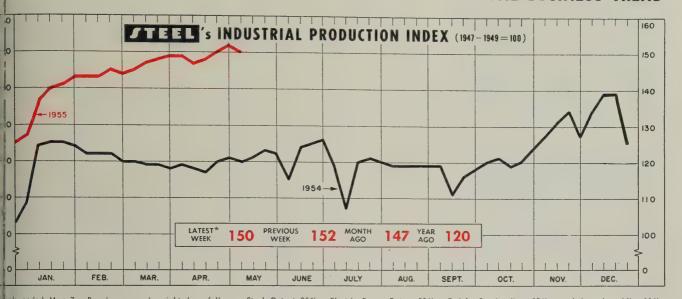
Every lot of Timken forging steel responds uni-

formly to heat treatment because every lot has the same physical and chemical properties. For example we rigidly control chemistry with the help of direct-reading spectrometer which tells us the example composition in 40 seconds . . . while the steel still molten.

To top it off, Timken steel forging bars save yo steel because their good dimensional tolerance produce uniform weight multiples with a minimu of steel lost in flashings. Get all these results in yo forgings. Specify Timken forging steels. The Timke Roller Bearing Company, Canton 6, Ohio. Cabaddress: "TIMROSCO".



SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBIN



May 7. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%.

Business Signposts Continue To Point Upward

GNS of continuing good business e plentiful—new orders continue a good clip, backlogs are going and employment, which keeps nsumer buying high, is climb-

Manufacturers' new orders and teklogs in March rose to rates tualing previous highs. They ere up 8 per cent over February ter seasonal adjustment. The tins were widespread throughout the economy, though durable bods industries showed a relavely greater increase than non-trable ones.

Backlogs—Unfilled orders connue to mount, with primary mets and nonelectrical machinery nowing largest increases. Sales March totaled \$28 billion, up per cent from last March. Little hange is reported in inventories. From all indications, business is ontinuing in about the same vein, with sales good, orders and backlogs strong and inventories steady.

Employment—Reflecting the inrease in business, employment is triding ahead. From March to arly April, employment rose 1.2 million, while unemployment ropped 200,000, say the Labor and Commerce departments.

The jump in jobs to 61.7 million as the biggest for the month ince 1946. The drop in unemployment pushed the jobless total be-

low 3 million for the first time this year.

Buying — Agriculture and construction showed their usual spring expansion. Of perhaps greater importance is a gain of 40,000 in factory employment, which usually takes a good-sized drop about this time of year.

The better employment situa-

tion shows up in consumer buying. Installment credit increased by \$466 million in March, compared with a decline of \$201 million in that month last year and an increase of \$430 million in 1953, the Federal Reserve Board reports. Big gainer was automobile paper, which accounted for all the boost in addition to making up

BAROMETERS OF BUSINESS	LATEST	PRIOR	YEAR
	PERIOD*	WEEK	AGO
INDUSTRY Steel Ingot Production (1000 net tons) ² Electric Power Distributed (million kw-hr) Bitum. Coal Output (1000 tons) Petroleum Production (daily avg_1000 bbl) Construction Volume (ENR_millions) Automobile, Truck Output (Ward's_units).	2,334	2,331	1,690
	9,600 ¹	9,699	8,438
	8,600	8,610	6,767
	6,834 ¹	6,836	6,422
	\$389,4	\$458.5	\$474.0
	220,961	231,021	154,640
Freight Car Loadings (1000 cars) Business Failures (Dun & Bradstreet, no.) Currency in Circulation (millions) ³ Dept. Store Sales (changes from year ago) ³	$728^{1} \\ 208^{1} \\ \$29,782 \\ +7\%$	730 212 $$29,657$ $+11%$	$\begin{array}{c} \textbf{648} \\ \textbf{206} \\ \$29,756 \\ +2\% \end{array}$
Bank Clearings (Dun & Bradstreet, millions) Federal Gross Debt (billions) Bond Volume, NYSE (millions) Stocks Sales, NYSE (thousands of shares) Loans and Investments (billions) ⁴ U. S. Govt. Obligations Held (billions) ⁴	\$21,764	\$19,661	\$21,234
	\$276.7	\$277.0	\$271.0
	\$19.1	\$20.9	\$18.4
	11,567	12,881	9,936
	\$84.8	\$84.9	\$79.1
	\$34.0	\$34.1	\$32.2
PRICES STEEL'S Finished Steel Price Index ⁵ STEEL'S Nonferrous Metal Price Index ⁶ All Commodities ⁷ Commodities Other Than Farm & Foods ⁷	194.53	194.53	189.74
	237.0	237.1	212.2
	110.4	110.4	111.0
	115.8	115.8	114.5

*Dates on request. ¹Preliminary. ²Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. ³Federal Reserve Board. ⁴Member banks, Federal Reserve System. ⁵1935-1939=100. ⁶1936-1939=100. ⁷Bureau of Labor Statistics Index, 1947-1949=100.



More

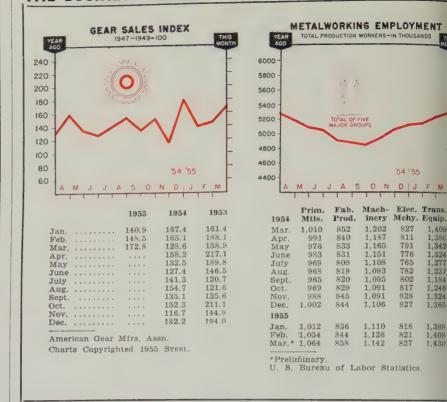
Metalworking

Rides on

Ole Man River

Traffic on inland waterways is growing at a phenomenal speed. This article will explain the reasons, show the effects of the boom on makers of barges and other waterway equipment and take a look into the future.

THE BUSINESS TREND



declines in other areas of installment buying.

Business: Good Into 1956 . . .

Record business in 1955 and a carry-over into 1956 are predicted by Roy Reierson, chief economist of Bankers Trust Co., New York. He foresees a gross national product of \$375 billion, 5 per cent above last year's and 3 per cent above the previous peak of 1953.

Records may be expected in industrial production, construction, retail sales, state and local spending, average hourly and weekly earnings, he says. Record or near-record profits also are in prospect this year, unless there are long, widespread strikes.

Rising plant and equipment outlays, inventory building and public construction will keep business good into 1956. Auto output and home building may slack off after midyear, but the momentum of the rest of the economy will keep things moving for the whole year.

Metalworking Cities Pick Up . . .

Two important metalworking centers, Pittsburgh and Cleveland, report business is still getting better. In Pittsburgh, activity is

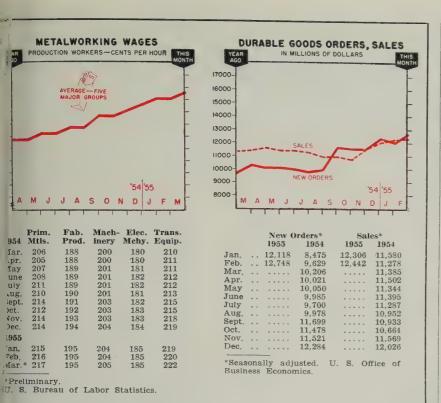
highest since late September, 195 says the Bureau of Business R search, University of Pittsburg Most impressive gain is in traction but industrial production as freight shipments are also up.

The extent of the business recovery is pointed up by the breau's seasonally adjusted index business activity; it's 200 per ce of the 1935-1939 average. month ago it was 178.9; at the end of February, 173.2. The indicate hit its recession low of 124.5 the week ended July 3, 1954.

In Cleveland, automobile sale established another all-time reord. Construction is at a twyear peak. Other business indicators are close to the highest leels of recent months, according the Federal Reserve Bank Cleveland. Unemployment corpensation claims declined by about 1000 for three successive week

With the League Leaders . . .

The auto industry has slowed its torrid pace, with Saturda work discontinued in many plant to indicate some slowup in the snappy sales pace. But production still is high and is likely stay that way until the labor situation is resolved.



'ruck builders are paralleling ns of passenger car producers. Ick output during April was it in two years, and is schedd for the same rate in May, acding to Ward's Automotive Rets. June also is likely to be a od month.

New construction outlays rose April to a new high for the onth of \$3.2 billion, the Labor Commerce departments rest. That means spending is at seasonally adjusted annual rate \$41.7 billion, compared with 54's record of \$37.3 billion.

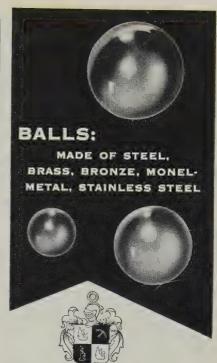
There were new highs for home dding, commercial buildings, plic utilities and highways. Instrial building remained encourngly steady, instead of showan April decline as in recent ers.

The continuing high level of atract letting seemingly assures other banner year for building.

ends Fore and Aft . . .

First-quarter sales and earnings Robertshaw-Fulton Controls are up from a year ago. John Robertshaw, president, says the rent high volume of industrial ivity and home building should reflected in a continued high

level of operations for the company . . . National Malleable & Steel Castings Co. foresees a seasonal decline in the third quarter but the possibility of a more pronounced fourth-quarter recovery than was looked for a few months ago, notes Cleve H. Pomeroy, president . . . Prospects for the remainder of 1955 appear to be good, remarks E. C. Bullard, president, Bullard Co. . . . Both sales and earnings of Vanadium Corp. of America in the first quarter were largest for such a period in the company's history, reports W. C. Keeley, president. "The improvement is due largely to increased demand for our ferroalloys, as a result of increased production of steel and aluminum; this year should prove the best ever for the company" . . . A substantial upturn in excavating and drilling equipment (that began in March and has continued) is expected to result in second quarter earnings being higher than those of first quarter, '55 and second quarter, '54, reports Bucyrus-Erie Co. . . . Indications are that earnings of Pullman Inc. will improve in the second quarter and continue that way in the second half, predicts Champ Carry, president.



HOOVER





This one SPEED NUT for either screw provides new savings!

If you use "A" and "Z" sheet metal screws in your product assemblies, here's good news for everyone from your design and production engineers to stock room clerks.

C7000 Flat Type Speed Nuts work equally well on both "A" and "Z" sheet metal screws-only one type of Speed Nut brand fastener to purchase, stock and handle. You reduce inventories, eliminate parts mixing. And you can also lower unit costs through larger quantity purchases.

One Speed Nut replaces three parts . . . lock washer, threaded nut and spanner washer. Yet it offers an attachment that is permanently tight until you want to loosen it!

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Flat Type Speed Nuts cut costs of attaching auto radio speaker to haffle



Air-conditioner control-panel assembly costs cut 40% with help of Flat Type Speed Nuts.



Special Flat Type SPEED NUT reduced assembly time 87% on washer motor mount bracket.





JOSEPH H. CANNON
... Clifford-Jacobs Forging president



ROLLIN M. BEUTEL
. . . Paterson-Leitch president



DR. IRVING A. OEHLER
. . . American Welding mfg. manager

seph H. Cannon was elected present, Clifford-Jacobs Forging Co., nampaign, Ill., to succeed W. E. Clifford, founder and present, who becomes chairman of board. F. H. Bachman succeeds r. Cannon as executive vice present and continues as secretary-easurer.

rilliam A. Steele was elected vice resident - operations, Wheeling teel Corp., Wheeling, W. Va. Alert H. Shonkwiler was made genal manager of the Steubenville, ., Works; and W. H. Holman, ssistant general manager.

resident, Henry Disston & Sons Ic., Philadelphia. He was execute vice president. Jacob S. Diston Jr., president since 1947, was lected chairman of the board to acceed his cousin, S. Horace Diston, who continues a director.

With acquisition of Mackintoshlemphill Co., Pittsburgh, as a divion of E. W. Bliss Co., Canton, O., ol. J. S. Ervin, former Mackinosh-Hemphill president, becomes director of Bliss and a member f its executive committee. J. R. atterson, Mackintosh vice presidentsales, is now a vice president f Bliss in charge of the new divion. C. H. Paul, Mackintosh vice resident-treasurer, is assistant reasurer of Bliss. Rollin M. Beutel was elected president, Paterson-Leitch Co., Cleveland, and W. J. Shenk was made chairman of the board. They succeed, respectively, R. I. Leitch and C. J. Paterson, founders of the company, who now serve as members of the executive committee. T. H. Paterson was named vice president to succeed Mr. Shenk. W. J. Shenk Jr., who succeeds Mr. Beutel as secretary, also was made a director.

George L. Berry was named chief engineer of Jones & Laughlin Steel Corp., Pittsburgh. He was manager of the plant and production engineering department, steel division, of Ford Motor Co.

Chris H. Bartlett and Charles C. Shutt were elected vice presidents of Westinghouse Electric Corp. Mr. Bartlett heads the manufacturing and repair division, Pittsburgh; Mr. Shutt the small motor division, Lima, O.

Benjamin Z. Ranan was made general manager of Great Lakes Stamping & Mfg. Co., Toledo, O.

C. O. Bartlett & Snow Co., Cleveland, appointed Norman R. Kidd manager of its service and parts sales division.

Albert Tintner joined Amthor Testing Instrument Co., Brooklyn, N. Y., as general sales manger.

Dr. Irving A. Oehler was made manager of manufacturing, American Welding & Mfg. Co., Warren, O. With the company since 1942, he was made administrative assistant to the president last January.

American Brake Shoe Co. elected Harry C. Platt president of its Engineered Castings Division, Rochester, N. Y. In its Brake Shoe & Castings Division, New York, Fred Biggs was made division chairman; Stephen S. Conway, division president and chief executive officer; and John F. Ducey Jr., sales vice president. Named to the new post of division vice president-railroad sales is Sam R. Watkins, formerly executive vice president of the National Bearing Division.

Ray G. Harrison was made vice president-sales and T. A. Reeves, assistant sales manager of Reeves Steel & Mfg. Co., Dover, O.

James F. Magin, vice president and a director of Square D Co., was appointed general manager of the firm's industrial controller division at Milwaukee.

Cyrus N. Johns, president, American Chain & Cable Co. Inc., Bridgeport, Conn., was elected chief executive officer to succeed Wilmot F. Wheeler, who continues as chairman of the board. Wilmot F. Wheeler Jr. was elected a vice



J. DOUGLAS JAMES
. . . Urick Foundry v. p.-gen. mgr.



H. M. DARDANI
. . . Miniature Precision Bearings v. p.



JOSEPH V. DELANEY
. . . Lodge & Shipley v. p.

president. Arthur C. Laske (continuing as secretary) succeeds Stanley Mann, retired, as treasurer.

J. Douglas James was elected vice president-general manager, Urick Foundry Co., Erie, Pa. Other appointments: Harold C. Talling, sales manager; James O. Smith, foundry superintendent; Howard F. Freed, sales service engineer; and Harold C. Boden, production manager.

George R. Weppler joins Harvey Hubbell Inc., Bridgeport, Conn., as vice president and assistant general manager. He was vice president-operations at Waterman Pen Co.

Lawrence R. Greenhaus was promoted from sales representative to New York district manager of Luria Engineering Co.

Burnell L. Verner and J. L. Gordon were elected vice presidents, Luria Bros. & Co. Inc., Philadelphia. Mr. Verner is Pittsburgh manager; Mr. Gordon, St. Louis manager.

Northrop Aircraft Inc., Hawthorne, Calif., named Ray Gayner vice president - manufacturing; George Douglas assistant chief engineer; and T. V. Jones head of development planning.

Milton T. Schimmel was made general manager and Gerald D. Minnick plant superintendent of Conforming Matrix Corp., Toledo, O.

Miniature Precision Bearings Inc., Keene, N. H., elected H. M. Dardani vice president-manufacturing. Formerly chief process engineer, he now co-ordinates activities of the engineering and manufacturing departments. R. H. Carter was made chief engineer; R. H. Gengenbach, manufacturing superintendent.

John A. Wettergreen, general works manager, was elected vice president-manufacturing at Bucyrus-Erie Co., Milwaukee.

C. G. McGlynn was made purchasing agent and R. L. Franz assistant purchasing agent of Aluminum Goods Mfg. Co., Manitowoc, Wis. Mr. McGlynn succeeds the late E. W. Hall.

Follansbee Steel Corp., Follansbee, W. Va., appointed Alfred R. Florio general manager of its sheet metal specialty division. Mr. Florio also is vice president of Louis Berkman Co., Steubenville, O.

At Food Machinery & Chemical Corp.'s Peerless Pump Division, Los Angeles, Carl L. Nickel was made product sales manager, water systems and dealer line products; and Norman C. Olson, product sales manager, engineered line products.

Brainard Steel Division, Sharon Steel Corp., named Jack V. Donner eastern regional sales manager for steel strapping sales, with headquarters in Cleveland; and Earl J. Goetz, midwestern regional sales manager, Chicago. Lodge & Shipley Co., Cincinnat appointed Joseph V. Delaney vice president. He continues as director of the company and general manager of the Hamilton Division

Webster-Chicago Corp., Chicago elected Edward R. Johnson vice president-treasurer; H. R. Letzte vice president-general sales manager; Walter Hermann, vice president and director of operations H. D. Von Jenef, vice president general manager, government division; E. J. Moritz, vice president general manager, laminations division; and C. S. Castle, vice president-eastern division manager.

Frank S. Brewster joined Brumley Donaldson Co., Los Angeles, a foundry consultant.

S. B. Knutson was named plan manager in charge of production at Kidd Drawn Steel Co., Aliquij pa, Pa. He was superintendent of the Flex Steel Division of Nationa Electric Products Corp. T. S. Paln quist was made director of eng neering and development. Alex ander H. Gaal, a former vice pre ident of Earle M. Jorgenson Co was made sales representative cover California, Arizona ar Nevada, with headquarters at Pa adena, Calif. Robert H. Creme covers the Pacific Northwest, wit headquarters at Portland, Oreg.

Merritt L. Smith was made executive advisor of Metal & Therm Corp., New York, to assist the

Take a Tip from This Forging Job



To meet the urgency of military requirements, the forgings industry took giant strides in developing blades and buckets for jet engines.

The steels used in these forged parts are extremely tough titanium alloys. Shape of the part is unusually complex and difficult to machine. By working out methods to press forge these parts, the forging industry was able to mass produce them to tolerances that all but eliminate machining and economize on the expensive material, too.

There are many parts like this one which can be produced with much greater economy. This may be true about some parts that you are making. We'd like to send an engineer who can talk your language and share your problems. There'll be no obligation.





CLEARING PRESSES THE WAY TO PERSONAL PROBUCTION

CLEARING MACHINE CORPORATION DIVISION OF U.S. INDUSTRIES, INC.

president in the sales activities.

A. J. Jarreau was made manager of the sales department of Barden Corp., Danbury, Conn.

M. J. Ross was named manager, export trade, for both the Quaker Rubber Corp. and the Watson-Stillman Co. Divisions of H. K. Porter Company Inc., New York.

Arthur E. Maha becomes sales manager of Link-Belt Co.'s Dodge plant in Indianapolis to succeed the late G. Harold Woody.

K. Leslie Morgan resigned as director of purchases and traffic at Le Roi Division, Westinghouse Air Brake Co., to organize the Ken Morgan Sales Co. at Milwaukee, to service engine, automotive and construction machinery industries.

Richard C. Crouch was elected president and treasurer, Acme Aluminum Alloys Inc., Dayton, O. He succeeds B. D. Claffey who resigned the presidency a year ago.

North American Refractories Co., Cleveland, elected H. E. Stuhler president; E. W. Valensi, first vice president and treasurer; Joseph A. Stott, sales manager; and Sue P. Pejeau, secretary.

H. L. Guthrie was made assistant director-purchases, American Bridge Division, U. S. Steel Corp., Pittsburgh.

Frank L. Sonneman replaces Robert J. Sheridan, retired, as division manager of Triplex Screw Co., Cleveland, division of Murray Corp. of America.

Herbert S. Hersey, president of C. O. Bartlett & Snow Co., Cleveland, was elected president of Grindle Corp., Harvey, Ill. He succeeds the late A. J. Grindle.



C. A. BRASHARES



A. BRENT WILSON

. . . vice presidents of Harbison-Walker Refractories

Harbison-Walker Refractories Co., Pittsburgh, elected C. A. Brashares vice president-sales and A. Brent Wilson vice president-subsidiaries. Mr. Brashares was general sales manager. Mr. Wilson served as assistant to the president. A newly elected director is W. C. Robinson Jr., president of National Electric Products Corp.

John A. Donnelly was made general manager, American Steel & Alloys Corp., Hartford, Conn.

Andrew M. Mras was elected executive vice president, American Metal Products Co., Detroit. He continues as treasurer and a director.

In the maintenance and utilities division of U. S. Steel Corp.'s Fairless Works, Morrisville, Pa., Roy L. Leventry Jr. was made superintendent. He replaces Kermit L. Johannsen, now assistant to the

vice president-steel operations at Pittsburgh.

F. Leroy Hill, president, Hill Machine Co., Rockford, Ill., assumes the chairmanship of Camdale Inc., East Detroit, Mich.

Chester Bland was elected president, Colt's Mfg. Co., Hartford, Conn., to succeed B. F. Conner, resigned.

Frank J. Kearns, vice president-engineering, Bridgeport Brass Co., Bridgeport, Conn., fills the newly created post of vice president-manufacturing.

Howard C. Liebing was made sales manager of National Tool Co., Cleveland. He was production control manager.

F. R. Brugler was elected comptroller, Bethlehem Steel Co., Bethlehem, Pa., to succeed the late R. H. Schlottman.

OBITUARIES ...

John M. Cook, 60, vice presidentgeneral sales manager, Behr-Manning Division, Norton Co., Troy, N. Y., and a director of both companies, died Apr. 14.

F. J. Peters, vice president, National Automatic Tool Co., Richmond, Ind., died recently.

Everett F. Merrill, president and treasurer of Merrill & Usher Co.

and Merrill Aluminum Co., Worcester, Mass., died Apr. 26.

John P. Mudd, 67, public relations director for Midvale Co., Philadelphia, died May 1.

John P. Breuer, 68, hob engineer, Barber-Colman Co., Rockford, Ill., died Apr. 20.

Morgan D. Douglas, 63, retired vice president of General Motors Corp., Detroit, and general man-

ager of its GMC Truck & Coach Division from 1945 to 1949, died May 3.

Frank W. Vosmer, 68, vice president, Union Iron & Steel Co., Cincinnati, died Apr. 26.

Quincy Bent, 75, a retired vice president of Bethlehem Steel Co. Bethlehem, Pa., and former director of Bethlehem Steel Corp., died May 5. He had been in charge of steel division operations.

to good advantage?

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(ANADIAN REPRESENTATIVES AT • Edmonton • Toronto • Vancouver • Winnipeg

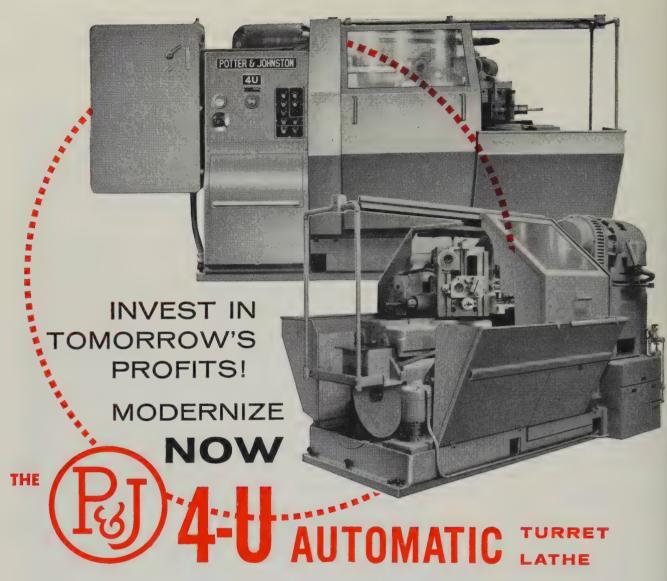
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fay 16, 1955



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- GREATER RIGIDITY . . . to maintain high precision and eliminate tool chatter under the heaviest cutting conditions.
- UNUSUAL VERSATILITY . . . independent front and rear crosslides, overhead pilot for added tool capacity, and many othe features . . . plus expertly engineered P&J Tooling . . . mean greater profits for a wide variety of work types and sizes.
- FAST, SIMPLE SET-UP... because all machine functions are controlled from a conveniently located, extra large dog drum.

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PRECISION PRODUCTION TOOLING



Junches Expansion Plan

Mited Engineering & Foundry I spend \$9 million to modernand improve facilities

MODERNIZATION and imvement program, involving but \$9 million to be spent over next two years, is being Anched by United Engineering Foundry Co., Pittsburgh. All ants will participate.

The company's main products rolls, rolling mills and auxilly equipment, shearing and Vavy special machinery, machine bls, forging presses, castings, didments and electrolytic lines. Advances in the design and efilency of tools, the need for inbeased capacity and confidence in e future are the determining facrs in expediting the program, ys Geoffrey G. Beard, president. Financing will be done through 10-year bank loan. The action llows approval by stockholders increase indebtedness to \$15

aster Electric Expanding

illion.

Master Electric Co. will erect a 600,000 addition to its plant in ayton, O. To house the firm's inch press operations, it will be ady for occupancy late in the

pens Los Angeles Warehouse

Bridgeport Brass Co., Bridgeort, Conn., opened a warehouse or brass and copper mill products t 6500 E. Flotila St., Los Angeles,

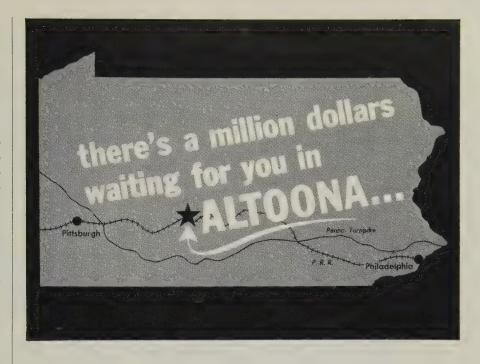
urton Mfg. Enlarges Plant

Burton Mfg. Co. is constructing 38,000-sq-ft plant in Santa Monia, Calif. Production of machine ools and surgical supplies will be tepped up.

caife To Make Heating Units

Scaife Co., Pittsburgh, loved into the consumer product eld with the purchase of the Timen-Silent Automatic Division of ockwell Spring & Axle Co. This ivision, which has its main office

(Please turn to page 94)



... to help you finance your new plant

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THE DRY FLUID DRIVE

DODGE of Mishawaka Announces An Entirely New Development in Industrial Power Drives that Promises to Revolutionize Drive Performance! Every Design Engineer and Plant Operating Man in America Will Want the Following Information.

Here are the facts on how easily Flexidyne handles difficult starting problems, and gives a *new* kind of protection against shock and overloads.

While new in the United States, this drive has already been proved in thousands of installations in Europe. Dodge has redesigned it to American standards and now makes its dramatic advantages available to all industry.

Flexidyne is a *dry fluid drive*. Its advantages over any other fluid-type drive are based on the fact that at normal operating conditions it *does not slip*.

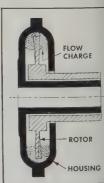
WHAT IT IS

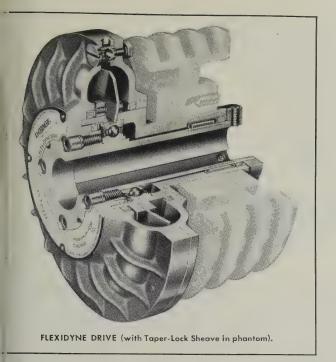
The Flexidyne Drive is made up of a housing, inside of which a rotor is free to turn concentrically. Between the two are fine particles of spherical steel shot, called the "flow charge," which acts very much like a fluid. The flow charge transmits power from housing to rotor.

This flow charge is easy to seal in, has a hig density and can stand relatively high temperature. The use of this flow charge makes possible a design that is simple, compact, economical, and gives our standing new and different operating characteristic

HOW IT WORKS

- 1. The motor is connected to the housing, and starts it turning at no load.
- 2. The flow charge is thrown to the circumference of the housing, is compressed by centrifugal force, and revolves with the housing.
- 3. The rotor, connected to the load, is started and accelerated by the friction as wedging action of the revolving flow charge.





Rotor and housing reach identical speeds—the exidyne operates with ZERO SLIPPAGE between moral load at normal running speeds.

Before overloads cause damage, the Flexidyne tor slips relative to the housing, overcoming the fiction and wedging action of the flow charge. A ermal switch (optional) automatically cuts the electical circuit if an overload persists.

The amount of the flow charge determines the rque capacity.

VHAT IT DOES

The Flexidyne gives you the exact starting torque ou need, for anything from the smoothest to the fast-st start. Once the load reaches normal speed, there zero slip, giving 100% efficiency. Also, it provides ccurate overload protection, as it can be set to slip any desired load. During starting and overload eriods the current draw is at a minimum because ith the standard Flexidyne setting the motor is never fulled down to less than 90% of synchronous speed.

All this is due to Flexidyne's completely new priniple, which produces constant torque for a given nput speed, regardless of the percentage of slip between the rotor and housing (which occurs only luring starting or overload).

The Flexidyne is simple to select off the shelf. Each ize has a standard horsepower rating and yet it is only a matter of minutes to vary the flow charge to give you your own tailor-made torque to suit the job.

With Flexidyne you get *uniform* performance revardless of changes in the surrounding temperature.

The Flexidyne has very long life and practically regligible maintenance. Its simplicity guarantees its

dependability. Gas and diesel engines also benefit from all Flexidyne advantages.

Aside from Flexidyne's low first cost, low maintenance, and top efficiency, it permits the use of smaller, cheaper motors and controls with greatly reduced current demands and improved power factor. Its smoother starts and gentler overload protection avoid breakage and reduce maintenance on drives, gears, bearings and driven machinery.

FLEXIDYNE COUPLINGS

Two lines will be available—Flexidyne Drives, for convenient mounting directly on motor shafts and adapted for Dodge Taper-Lock Sheaves, and Flexidyne Couplings with Taper-Lock Bushings, for straight line drives. Several thousands of these units of French design, in capacities ranging from fractional to thousands of horsepower, are now in use in Europe. Dodge will first offer — from stock — four sizes rated at 3 to 30 hp at 1800 rpm. Other sizes will follow.

Write now for special bulletin, delivery dates and application information.

DODGE MANUFACTURING CORPORATION 4400 UNION STREET, MISHAWAKA, INDIANA

CALL THE TRANSMISSIONEER, your local Dodge Distributor, Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.





PUNCHES·DIES

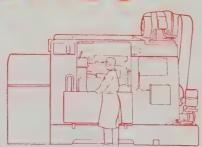
RIVET SETS · COMPRESSION RIVETER DIES



LET SIMMONS REBUILD AND MODERNIZE YOUR AUTOMATICS

Investigate the important production, maintenance and tax savings of SIMMONS ENGINEERED REBUILDING for your: Lathes, Planers, Surface Grinders, Cylindrical Grinders, Vertical Millers, Openside Planers, Automatics, Vertical Boring Mills, Turret Lathes and Radial Drills.

A qualified Simmons rebuilding engineer will discuss it with you. Write, wire or phone today. Simmons Machine Tool Corporation, 1755 North Broadway, Albany 1, N. Y.



Write for Simmons Way... case histories of rebuilding jobs.

SIMMONS GIVES MACHINE TOOLS A NEW LEASE ON LIFE

Unconditional guarantee.. our standard since 1910

(Concluded from page 91) and plant facilities at Jackso Mich., is a manufacturer of d mestic central heating equipmer Scaife Co., primarily a metal fabrator of pressure vessels, has plant at Oakmont, Pa.

Kent, O., Firms Merge

Twin Coach Co. is purchasing all the outstanding stock of Day Compressor Co., both of Kent, The Davey firm makes portal and industrial air compressor truck power take-offs, pneumattools and rotary drill rigs.

Producto Opens New Facility

Producto Machine Co., Bridg port, Conn., with Bossert Co., Ka sas City, Mo., is opening an asser bly warehouse at 17th and Ma Sts., the latter city. A comple line of Producto die sets, diema ers' accessories and toolrog equipment will be included in ta assembly operation.

Garrett Enlarging Plant

Garrett Corp., Los Angeles, erecting a \$1.3 million administration and engineering office builting, an extensive addition to present AiResearch Mfg. Division plant. AiResearch makes aircreaccessories and components.

Dreis & Krump Builds Plant

Dreis & Krump Mfg. Co., Clago, completed construction building No. 3. Containing 40,0 sq ft, it adjoins other compabuildings. It is equipped to hand the welding, frame machining a production-line assembly of the firm's smaller press brakes a presses of 11 to 150-ton capaties. The company makes malarger models.

Bristol, Conn., Firm Expands

Deliveries will be completed to year on \$1,850,000 worth of equipment purchased by Associated Spring Corp., Bristol, Conn., its various plants. Part of it is operation. Installation of a Serzimir, reversing, cold-rolling in at Bristol will be completed to year; with auxiliary equipment.



CROSSING THE WALLKILL at New Paltz, N. Y. are the new and the old in U. S. bridge-buildng. Foreground: N. Y. State Thruway bridge erected by Phoenix Bridge Co. is 356 ft. long, 07 ft. wide, weighs 1778 tons. General contractor: Corbetta Construction Company, Inc. n distance is Perrine's Bridge built in 1850.

Three-handed bridge

The sign on this New York Thruway dge says "Phoenix"—but the structure ictually the product of three Barium

iteel plate came from Central Iron and el Company; structural members from benix Iron & Steel Company; while rication and erection were done by Denix Bridge Company, live-wire vetn of 91 years in the bridge-building iness. Tie that for a smooth-running, egrated operation.

Bridge-building is only one field where

Barium delivers the goods faster. Reason? We can focus the resources of 16 separate companies on the job. And there aren't many jobs the Barium team isn't able to take on. Reason for that? Unique diversification - from asphalt barges to magnesium airplanes - plus an alert management intent on keeping Barium a step ahead of the field.

Your copy of the Barium Story, which goes behind the scenes at Barium, is waiting. Just write Barium Steel Corporation, 25 Broad St., New York 4, N.Y.



Steel Producers

Chester Blast Furnace (pig iron) • Central Iron and Steel Company • Phoenix Iron & Steel Co.

Steel Fabricators & Processors

Phoenix Bridge Co. • Industrial Forge & Steel, Inc. • Globe Forge, Incorporated • Geometric Stamping Co.

Manufacturers of End Products

Clyde Iron Works, Inc. • Erie Bolt and Nut Company • Bayonne Bolt Corp. • Cuyahoga Spring Company • Jacobs Aircraft Engine Co. • Kermath Manufacturing Company • Kermath Limited (Canada) • Wiley Manufacturing Co.

Lightweight Metal and Plastics East Coast Aeronautics, Inc.



this will increase cold rolling at finishing capacity 50 per cent. Bristol, Associated Spring pr duces high-carbon, annealed, col finished, spring-steel strip at tempered spring steel, 0.61 to 1.6 carbon.

Byers Machine Changes Hands

Plant and inventory of Byen Machine Co., Ravenna, O., have been acquired by Thew Shovel Co. Lorain, O., for a little over \$900,000 in cash. A. C. Lundgren president of a subsidiary corporation, Byers Machine Inc., which has been formed to operate the Ravenna plant. Other officers Vice presidents, E. C. Brekelbaur and W. V. Clark; secretary and treasurer, R. W. Gleason; assistant secretary, Brooks Maccracken. W. Blauvelt is general manager.

Sulphuric Acid Plant Opened

E. I. du Pont de Nemours of Co.'s Grasselli Chemicals Department has brought into commercial operation the huge sulphuric activation plant at its East Chicago (Ind. Works. It is capable of turning out more than a trainload of activation week.

Helipot To Enlarge Facilities

Helipot Corp., South Pasadena Calif., manufacturer of precision potentiometers and other electron ic components, acquired a 15-act site at Newport Beach, Calif. Ac ditional production facilities with be built.

Warehouse Changes Name

Roth Steel Warehouse Co., 227 S. Lumber St., Chicago, Ill changed its name to Riversid Steel Warehouse Corp.

Diversifies Hardware Lines

North & Judd Mfg. Co., New Britain, Conn., purchased the major assets, including the plant equipment and name, of Wilcox Crittenden & Co. Inc., Middletown Conn. The property will be operated as the Wilcox, Crittenden Division. Phelps Ingersoll, president of Wilcox, Crittenden, will continue in charge of the division



PRODUCTS IMPROVE STEEL MAKING FROM CHARGE TO FINISHED INGOT

The United States Graphite Company has served the steel industry for a half century with products to improve steel making from the furnace to the finished ingot. Our engineering service and laboratories are constantly working on new products to solve your steel production problems. The products listed here are a few of the most popular and widely used — why not investigate them — they can cut your costs.

RECARB-X®

(engineering bulletin #11)

insures carbon specifications

RECARB-X is ideal for off-carbon heats. A fifty pound bag per 100-tons of steel will raise carbon two points when added to the ladle. RECARB-X dissolves quietly, gives uniform, dependable carbon recovery at all carbon levels. There are grades of RECARB-X for the furnace charge.

MEXICAN_® MOLD WASHES

(engineering bulletin #15)

for better ingot surfaces

For as little as ³/₄c per ingot ton, you can insure quicker, easier mold stripping with MEXICAN Ingot Mold Washes. MEX and 90-B can be applied at any temperature and are easy to prepare and use. Where a high volatile "gas kick" is needed, VOLMEX or XF-81 will supply the answer. For an inert, non-carbonaceous mineral coating, XF-88 will do the job.

MEXATOP

(engineering bulletin #5)

gives sounder ingots

MEXATOP is a powder compound which spreads easily over molten ingot heads and casting risers. A 3/8" layer over the molten surface works effectively to prevent cavitation and insure sounder castings.

Write for Engineering Bulletins describing these products.



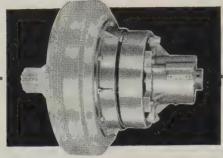
HE UNITED STATES GRAPHITE COMPANY

VISION OF THE WICKES CORPORATION . SAGINAW, MICHIGAN

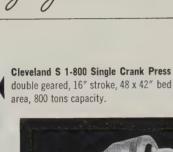
y 16, 1955

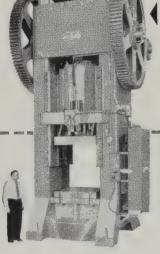
Less Down-Time With CLEVELAND Presse

Powered by the Clutch that's

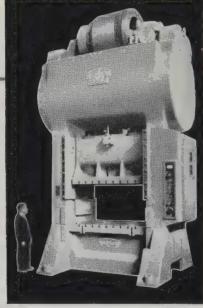


"Revolutionizing" Production





Cleveland S 2-350-60-42 Double Crank Press, 8'' stroke, $42 \times 60''$ bed area, 350 tons capacity.



Why not investigate the production economy built into every Cleveland Press Equipped with our patented Cleveland Drum Type Clutch. Won't you let us give you the complete Cleveland story? Write or call today!

Cleveland S 4-600-204-102 Four Point

Press. 40" stroke, 102 x 204" bed area,

600 tons capacity.

It doesn't matter which of the 11 types of Cleveland presses best meets your requirements. For as long as it is equipped with our patented Cleveland Clutch, you can be confident that you are getting a press that will give you the best performance obtainable. This proven clutch unit assures minimum down-time, positive, fast control and lower operating costs.

Designed with a minimum number of parts, the patented Cleveland Drum Type Friction Clutch requires only minor adjustments. There is less chance of failure. Its light-weight construction reduces horsepower required for operation. Operational studies prove it to be completely dependable.



POWER PRESSES

FABRICATING TOOLS

E. 40TH & ST. CLAIR AVENUE . CLEVELAND 14, OHIO
Offices at: NEW YORK . CHICAGO . DETROIT . PHILADELPHIA . E. LANSING . OXFORD, O.
CITY FOUNDRY DIVISION . SMALL TOOL DEPARTMENT



ch makes boat equipment, adware, marine lights and mafir plumbing fixtures.



ASSOCIATIONS

he Lead Industries Associa
New York, elected officers:
Firew Fletcher, St. Joseph Lead

New York, president; K. C.

wnell, American Smelting &

ining Co., New York, vice presit; J. A. Martino, National

d Co., New York, vice presit, and M. M. Zoller, Eagleher Co., Cincinnati, vice presit.

Robert L. Ziegfeld was re
ted secretary-treasurer.

she American Zinc Institute, w York, elected the following cers: F. S. Mulock, U. S. ielting, Refining & Mining Co., president; C. Merrill Tapin Jr., St. Joseph Lead Co., w York, vice president; R. G. aly, New Jersey Zinc Sales Co., w York, vice president. E. H. der, Combined Metals Reduc-1 Co., Salt Lake City, Utah, was oned vice president, while Erle Daveler, American Zinc, Lead & lelting Co., St. Louis, was rected treasurer. John L. Kimwley was named secretary and mest V. Gent was re-elected exwtive vice president.

The National Fluid Power Assotion, Evanston, Ill., elected the lowing officers: President, J. E. skine, Racine Hydraulics & Manery Inc., Racine, Wis.; first e president, O. Wendell Macy, draulic Power Division, Hydrau-Press Mfg. Co., Mt. Gilead, O.; cond vice president, J. J. Pipager, Double A Products Co., inchester, Mich. Barrett Rogers executive secretary.



NEW ADDRESSES

99

Wilmar Mfg. Co. Inc. moved its ices to 1110-16 Truman Rd., ansas City 6, Mo.

Correct address of Ziv Steel & ire Co.'s Milwaukee office and irehouse is 2225 S. 38th St. previous issue incorrectly rerted the address.







Republic Wedge-Lock Steel Shelving solves the problem of storing castings, patterns and other items. It is specifically designed for high stacking of enormous weights—with no sagging, swaying or buckling. As weight increases, joints get tighter, increasing the stability and rigidity of the entire assembly. You get maximum loading in a minimum of floor space. It's completely flexible, can be assembled quickly and easily.

Republic Chain Slings provide an exceptionally high a gree of safety in foundry operations. Republic mathree types, alloy steel, high carbon steel, and wrou iron. A Republic Chain Engineer will tell promptly and partially which type is best suited to your particular need. All Republic Chain Slings are proof tested and warrant

vith a fine finish call for HATEAUGAY PIG IRON

Kidder multi-color rotary presses for flexographic, rotogravure and letterpress printing are as precise as a fine timepiece. Nothing is spared to meet the known requirements for perfect printing. Only the finest materials are used, including Chateaugay Pig Iron.

Kidder's requirements for cast parts are strict. They call for a fine surface finish, wear-resistance, high strength and top machinability. To meet these requirements, they use Chateaugay, Republic's exclusive premium Pig Iron.

Chateaugay's consistently uniform physi-

cals assure predetermined fine grain structure throughout every casting, regardless of size or shape. It is an exceptionally fluid iron—cools evenly—fills adjoining light and heavy sections completely.

In addition, Chateaugay castings machine beautifully and economically, whether milled, drilled, turned, tapped, ground or threaded.

A Republic Pig Iron Metallurgist will be glad to show you how Chateaugay, the low-phosphorous, copper-free Pig Iron, consistently outperforms other pig irons. There's no cost or obligation. Mail the coupon for prompt action.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products



public Foundry Flasks speed molding efficiency through ease of eration, ease of handling and through long trouble-free service. ch cope, cheek and drag is welded into one integral piece of el, ribbed and flanged to provide strength and rigidity. Flasks to be designed and manufactured in various sizes and gages of el to meet your individual requirements.



REPUBLIC STEEL CORPORATION 3 | 20 East 45th Street • Cleveland 27, Ohio

- ☐ Please have a Pig Iron Metallurgist call.
- I am interested in more information on:
- ☐ Chain Slings ☐ Steel Shelving ☐ Foundry Flasks

Name_____Title____

Company_____

Address

City____State____State____



Mating the handle and bristles of a good paint brush is a difficult problem at best. But building a machine to do it automatically is an exercise in higher imagineering. We know, because a well-known paint manufacturer recently brought us this problem.

Taft-Peirce engineers helped to design and build several machines that do the job. Space the bristles in the handle, secure them, trim them, and finish them ready for shipment. The result — a better, more uniform product at lower cost.

This is just one of the hundreds of different machines and mechanisms conceived and built every year in the Taft-Peirce Contract Division. For a more complete picture of our facilities and experience, send for 92 page illustrated booklet, "Take It To Taft-Peirce."



For Engineering Tooling Contract Manufacturing

TAKE IT TO TAFT-PEIRCE

The Taft-Peirce Manufacturing Co., Woonsocket R. I.

TELEPHONE, WOONSOCKET 1



1955 Management Series . . .

The editors of STEEL herewith present the fourth in their ten-part series, Program for Management for 1955. The complete list:

- 1. Product Promotion (Feb. 14, p. 73)
- 2. Budgeting for Cost-Cutting (Mar. 14, p. 93)
- 3. Plant Layout (Apr. 18, p. 93)
- 4. Communications
 (May 16, p. 103)
- 5. When To Re-equip
- 6. Put Business Trends To Work
 (July 18)
- 7. Consultants
 (Aug. 15)
- 8. Purchase Analysis (Sept. 19)
- 9. Market Facts (Oct. 17)
- 10. Keep Your Product Growing

• Extra copies of this article are available in quantities from one to three until supplies exhausted. Write Editorial Department Steel, Penton Bldg., Cleveland 13, O.





FIVE STEPS TO UNDERSTANDING:

. . . . Clarify the idea or problem

. . . Get participation

. . . Transmit ideas and decisions

. . . Motivate others to act

. . . Measure the effect

FAILURE IN ANY STEP CAN MAKE COMMUNICATION MISFIRE

Business Communication:

ut it on executive-saving time

E CONFERENCE was badly anized and poorly led. The blem to be solved was not clear-defined. Attention of the conces wandered. The meeting gged out.

The executive vice president dled the salaries of the conence members. His conclusion: the meeting cost us \$360 an hour. Should have taken 30 minutes cost \$180. It took 3 hours, the \$1080."

alk, Talk, Talk—Conferences, phone conversations, letters, nos and across-the-desk talks a big bite out of any indus-

trial executive's day. Still they are essential to the conduct of today's complex business organization.

If communication is effective, the business will run smoothly. If it is not, the enterprise is likely to flounder.

Cost of Failure—Many of management's problems are traceable to communication failures. The production department neglects to inform sales that deliveries cannot be made on schedule. Sales forgets to tell production of demand that will require a change in product mix. A quickie strike is called because a supervisor failed to report

a crane operator's dissatisfaction. A department head spends several days writing a 30-page report which is not read because his superior wanted a one-page summary.

The cost of miscommunication is beyond calculation—not only in terms of time and money but in misunderstanding, inefficiency and ill feeling.

Big as Life

The problem of communication in business is as big as all outdoors. It rapidly is gaining recog-



Steps toward more effective conferences

- Provide best physical facilities available. Arrange chairs and tables to enable conferees to face each other. Place visual aids where they can be seen by all. Adjust heating, lighting, ventilation. Supply plenty of ash trays if smoking is permitted. Provide note paper and pencils.
- Establish group parity. In a problem-solving conference, the janitor ranks with the president.
- Get off to an enthusiastic start. The conferences will be easier to maintain. Conferences bogging down at the beginning are difficult to shift into high.
- Define the problem clearly and state the objectives. Obviously, this suggests preliminary work and thought by management.
- Outline procedure. Outlaw glorified bull sessions.
- Encourage participation by all conferees. Draw out those who are timid. Control those who would "hog" the conference.
- Develop the facts surrounding the problem. Again draw on the combined knowledge of conferees.
- Summarize frequently. It helps to record suggestions.
- Seek all possible solutions. Brain storming a problem may reap unexpected rewards.
- Select the best possible solution. Preferably it should be reached by consensus rather than by majority vote.
- Convert the decision into effective action. Nothing is more useless than the right solution that disappears into a filing cabinet or is quietly sabotaged by those charged with putting it into effect.
- Communicate the decision and the method of putting it into effect to all persons affected.

nition as one of industry's major problems.

In the good old days, business enterprises often were managed by one man, generally the owner. He held a tight rein of direction on all aspects of the business, made most of the decisions and delivered them personally to those affected. Communication was a horse-and-buggy problem.

With the development of big business and team management, the communication problem grew in geometrical progression.

Essential to Teamwork—"Satisfactory progress toward our objectives requires an integration of the thoughts and actions of the people involved," says J. L. Atwood, president, North American Aviation Inc. "There are many common names for this integration. It is the co-ordination we speak of in business, and esprit decorps in the military; it is just plain teamwork in any human endeavor. No matter what name we

use for this happy state of affa it obviously cannot be achieved maintained without commun tion."

No universally applicable by print for effective communicate within the management group been devised. Nor is it likely ever will be. Companies vary greatly in size, nature of we types of personnel, operation problems and objectives.

This does not mean that theo and practices found successful other companies cannot be adapt to yours. Nor does it mean the skills of effective communition cannot be learned.

Back to School—In response demand for more knowledge a skill in communicating in busing the American Management Assation this year launched a continuing, three-week course in exputive communication. More that 500 business and industrial executives signed up.

The National Industrial Confence Board offers a one-we course in "How To Lead a C ference." It stemmed from the c sensus of top management: "many meetings are only a wa of time, a rehash of old ideas monologues by a top executive

Management recognized the cessity for and value of condences which pool the knowled and thinking of a group. It dinosed the trouble with the proference as lack of proper ganization and inferior leadersh

Training courses demonstr that there are certain princip and procedures the leader m know and put into practice.

Recognized, learned and applithey can provide precision a economy in business communition.

Intangible—The art of commucating is still too little understo. It is so intangible that even most expert in the field have diculty in communicating what it all about. A number of collegoffer seminars and courses in communication. Lecturers by the scare talking about it from players. Communication consulta are offering their services. Maccompanies employ technicians a specialists to set up communition departments.

How can you make sure

shades of meaning you intend? he consensus of metalworking entires interviewed by STEEL is business communication is will continue to be one of intry's most difficult problems. y are almost unanimous that municating is one job that canbe delegated, but must reside the executive himself.

et they believe communication be improved substantially by ning and following proved proires for handling conferences, phone conversations, letters, nos and directives, informal versations and other means of veying information and ideas.

Conferences

hey believe conferences can be er organized and conducted to effect to group dynamics. They eve modern management reses such meetings to draw out thinking of many minds. They such meetings result in desons being put into effect more ciently because the people in rge will better understand the vs of the action.

vs of the action. op-level executives use the conence as one of their most imtant administrative techniques. ny estimate they spend onerth of their workweek "in conence." Their biggest single comint: "Conferences waste time." erve Many Purposes-While the ference usually is considered a ans to problem solving or deon making, it actually serves ny purposes: 1. To gain awares of problems that need atten-1. 2. To obtain better problem ving within the organization. 3. increase the acceptance of deions by colleagues, superiors and ordinates. 4. To improve the lity to execute decisions by inasing understanding of the blem and the proposed solution. The conference is possibly the st misused and, consequently. most maligned institution in business field," believes Mr. wood. "There is often some basis the statement that the best rk is done by a three-man comtee with two members absent. wever, the conference can be an

ective management tool if some

ught is given to good confer-

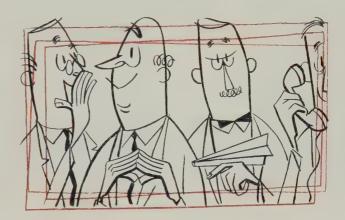
ence techniques."

To this end North American circulates to its supervisors a pamphlet on better staff conferences. It urges:

1. Be problem minded; explore the subject thoroughly before forming an opinion.

- 2. Restate the other man's opinion to his satisfaction before you reply to him.
- 3. Don't allow yourself to get irritated by a word or an idea. Hear the man's whole story.

To these ideas is added the admonition that a conference requires



Ten ways to louse up a conference

- 1. Schedule it for "about" a certain time.
- 2. Don't give adequate notice.
- 3. Keep the subject secret.
- 4. Set no time limit.
- 5. Skip visual aids.
- 6. Permit sideline conversations.
- 7. Let the leader be unprepared.
- 8. Let the leader do all the talking.
- 9. Talk solutions first, facts later.
- 10. Permit telephone calls to be transferred to the meeting room.

That will waste at least 15 minutes. Late-comers will interrupt, will have to be brought up to date.

Many of the people will be dated up with important customers, will have to skip the meeting.

It will prevent participants from preparing.

It could encourage the meeting to run on and on.

An all-oral session will be more conducive to dozing.

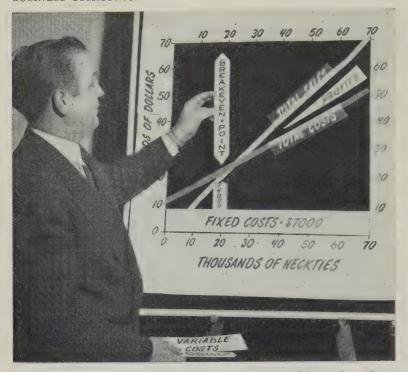
Three or four going on at once insure failure of meeting, make time wastage complete.

The meeting will bog down and everyone may spend 3 hours to accomplish what could have been done in 30 minutes.

Nonparticipation insures boredom of other members. Prevents cross fertilization of ideas.

It makes selection of best possible answer unlikely. It enables members with pet nostrums to argue for them without reference to facts.

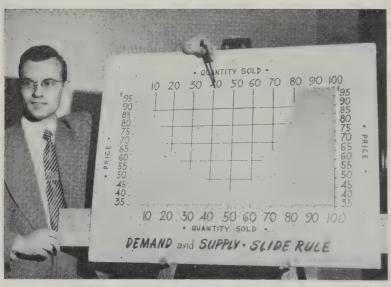
They will interrupt not only the person called but everyone else.



Flannel slap-on board permits the leader to build up his ideas graphically, step by step. Specially adaptable for set presentations



Flipchart with general conclusions prepared advance helps present ideas more effective



Trick devices, like this supply-and-demand slide rule, can add interest

Give your ideas eye appeal

Visual aids can make communication in a ferences and meetings faster and more effive. Well used, they liven up the proceeding provide a change of pace and prevent meetings.

They make the conference leader's prestation simpler. But they require careful praration.

Projectors for motion pictures and slides usuare available for meetings. Trick devioten are effective in getting over a particular point.

Visual aids shown here are some used Republic Steel Corp.

intelligent leadership to keep it on the track.

Effective conference leadership can best be learned through practice conferences under skilled direction, says Manley E. Brown, director of training for Lear Inc., Grand Rapids, Mich.

For this reason, many metalworking companies are conducting courses in conference leadership for their supervisors. Often a trained conference leader is called in to conduct the practice session.

Skill in conference leadership also increases effectiveness in conference participation.

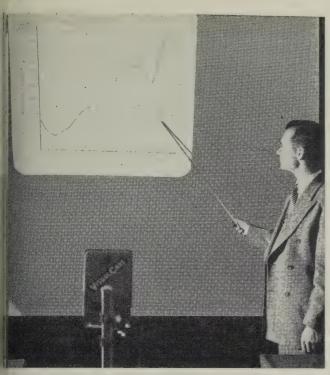
A highly effective course in conference leadership for supervisors was developed by Standard Oil of New Jersey several years ago. The manual used is based on experience gained in training many hundreds of conference leaders and has served as a guide for other companies.

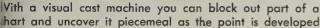
The Telephone

If you think your wife misus the telephone, check with your of telephone operator. Chances a you will get a liberal education inefficient telephone usage in you own company.

Simple procedures and tact can improve (see page 108) to phone communication greatly, p reduce the time and cost of ca

A department head in a Cle







Participation is encouraged by the giant pad. A place to record suggestions, it's less messy than the blackboard

nd company was called on the repet when long distance tolls for division jumped sharply. He ked for and received a breaktwn of charges. Many toll charges are \$8 to \$10. One, to Chicago, st \$12.15 for a 46-minute contraction.

Long-Distance Burping — The an making the high-cost calls insted he was obtaining informan from customers and that a of time was required. His surior suggested that he have seval calls recorded and analyze The long-winded caller aved back a lot of aimless conrsation and word burps. When pre-organized his calls, his avage toll charge dropped 80 per nt, and he had time to cover iny more customers. The men at e other end of the line saved ot of time, too.

Written Communication

Better organization of letters, emos and directives, plus the apication of communication skills, n make a few sentences do the ork of several pages of gobblegook.

Any executive wading through e mass of correspondence he ces daily appreciates the old story of the man who wrote a three-page, single-spaced letter and apologized at the close: "I could have put it all in two paragraphs if I had taken time to organize it."

Minneapolis-Honeywell's Brown Instrument Division recently organized a verbiage pruning class for its letter writers. Since the division sends some 3000 letters daily, besides composing and circulating about 5000 interoffice memos, C. L. Sheetz, training director, estimates inefficient communication is costing the firm hundreds of thousands of dollars yearly.

Stilted on Stilts—Contributing to that inefficiency is the tendency to "write like a man walking on stilts," comments Mr. Sheetz. The company's executives are being taught to organize their thoughts before dictating. Then they learn to talk clearly (without chewing pipe or cigar) and to use simple, clear words and short sentences.

Ben Bennett, editor of Republic Steel Corp.'s management letter, checks his readers frequently to determine what kind and how much information they want. Most frequent advice: "If you use more than a paragraph, we won't read it."

Across-the-Desk

The individual executive probably spends the greatest portion of his communication time in informal, face-to-face conversations. They may be with his equals, superiors, subordinates or people outside the company.

Because such conversations generally are informal, the tendency is to prolong them beyond the time needed to accomplish their purpose. Pointless trivialities intrude.

Leisurely across-the-desk conversations have many benefits. Often, they are exploratory and reveal situations or problems that need attention. They may suggest solutions to problems already recognized.

Morale Builders — Sometimes they are effective in instilling enthusiasm in subordinates for a project or for the organization. They are a means of imparting wider and deeper understanding. They can help weld the management team. Under such circumstances, extending the conversation may be warranted. There is no virtue in brusqueness per se.

The wise executive will want to weigh the benefits of conversation against the time consumed. If all the man-hours wasted in idle conversation at any business organization were added up, the total would be staggering.

On Your Feet—What to do about the visitor who lingers in your office after his business is finished? Or the associate who drops into your office just to pass the time of day? It is an individual problem. There are no rules that can be applied universally to end non-

productive talking without offending the other party. Executives must develop their own techniques.

One of the most effective is to rise when the conversation has reached its business purpose. That will send the loitering visitor on his way, and, if done casually, will not offend.

You can save time by going to a subordinate's office rather than

calling him to yours. The initiative to leave is yours. In addition, yourcrease his feeling of important by going to him.

Time Limit—Sometimes it made feasible to set a limit on a conversation at the start. This becomes necessary when appointments are scheduled. It also help you cover the subject in the time allotted.

Controlling a conversation remains an individual problem. The most effective way to prevent the inefficient use of time is to adop a business-like attitude. Be conscious of the value of time.

Communication's Objectives

While much of the foregoin stresses how to save time in conveying information and ideas, sight should not be lost of the real purpose of communication: To creat understanding, obtain co-operationand get action. Many businessme consider communication as a most important tool for getting thing done.

Harold B. Schmidhauser, director of the AMA communication course, says communication made any exchange of meaning. The AMA course is designed to improve the knowledge of executive concerning communication, to develop an attitude toward its importance and to develop specific skills.

Mr. Schmidhauser and his associates at AMA believe true communication includes the five step listed at the beginning of this art claim.

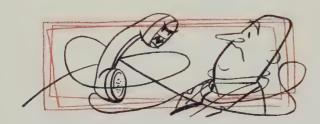
- 1. Clarify the idea or problem
- 2. Get participation.
- 3. Transmit ideas or decisions
- 4. Motivate others to act.
- 5. Measure the effect.

Clarifying the Idea

"The beginning of all commun cation is an idea," says Clarent Randall, chairman of Inland Ste Co.

There is no use opening the taif there is nothing in the tank.

Unless the idea is first clear formulated in the mind of the transmitter, the message is like to be misunderstood, says Fran E. Fischer, director of AMA



Telephone tactics

MOST of us have used the telephone since we learned to talk. To suggest that we may be using it improperly seems presumptuous.

But ask any telephone operator. The incorrect or careless use of the telephone results in expensive time wastage, innumerable mistakes, misunderstandings, loss of good will, even business.

To accomplish the aims of the business call—to communicate information, to sell yourself and your company in the least possible time—these practices are recommended:

- Don't say "hello." Identify yourself by name, company and department on both incoming and outgoing calls. If a caller doesn't identify himself, ask him.
- Pre-organize your calls. Be prepared to talk, perhaps with a check list at hand. Get the "ahs," "ers" and other word burps out of your conversation.
- Always be ready to talk when your party answers. You don't ring doorbells and run away.
- Dial your own outgoing calls. It saves time and your secretary won't lose you.
- If you leave your office after placing a long distance call, notify the operator where you can be reached.
- Try to get the same grooming into your voice that you put into your personal appearance. Your voice has to sell your purpose and your personality. Smile with your voice. Imagine your caller is sitting across the desk. Call him by name.
- Get to the point of your conversation. You can't improve the weather by talking about it. The person on the other end of the line has work to do.
- Talk into the telephone in a normal tone, with your lips no more than 1½-in. from the mouthpiece. Keep cigars, pipes, cigarets, gum, pencils out of your mouth. Speak distinctly. Talk at about 120 words a minute.
- Give immediate and undivided attention to information volunteered and the development of facts. Have paper and pencil handy to take notes.
- ELet the caller hang up first, if possible. Hang up gently.

magement course. "You can't have a clear print from a blurred virative."

The study of communication, mitinues Mr. Fischer, must begin the a careful and precise identification of the problem. It helps to bluce the problem to a simple tement. As John Dewey said: problem well stated is half eved."

The executive's next task is to the from all available sources that bear on the problem.

Evaluation—He selects what is portant and relevant to the probable and proceeds to examine possible solutions. He examines assimptions, weighs precedents and ticipates consequences. Finally, or chooses what appears to be the set solution and tests its logic dompleteness.

Getting Participation

Then he draws others into the blem. He does this primarily three purposes:

1. To clarify and test his own linking by sharing his solution th others.

2. To gather the ideas and sugstions of others in a position contribute to the solution.

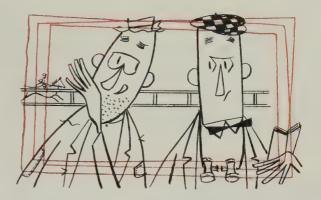
3. By inviting their participain, they become enthusiastic and plp carry out the decision.

Few problems are so simple, says r. Fischer, that an executive's inking cannot be sharpened by insultation. But remember: Many en who can create or plan brilintly are duds when it comes gaining the co-operation of thers. Productive participation relistening and a willingness to ledit others for their contributions.

Transmitting the Idea

Having arrived at a solution or ecision, the next step is to comunicate it to those who will put into effect or who will be afcted by it. You must plan careilly what to communicate, to hom to communicate and how est to do it. Whether the comunication is written or oral, care ust be taken to express it clearand simply.

The transmitter will want to



Tips for better written communication

Do . . .

- Set up a subject for each memo, letter or directive. Write it at the top of the page. It may be the name of an individual or company. It may be a proposal. It may be a single-sentence idea. If you can't specify a subject, don't write.
- Think before you write. Organize what you have to say. If the subject is complicated, make an outline.
- Make the memo clear. Make sure the recipient cannot misunderstand what you say. If words do not come easily, your thinking still isn't crystallized. Reorganize your thoughts. Rewrite.
- Be courteous. You can be firm, and still effective, if you take care not to offend the person addressed. If you write a "chew-out" memo, hold it over to tomorrow. Chances are you'll change your mind and the memo.
- Be brief. Most letters and memos are too long, communicate too little. Say what is necessary, then stop. Do your best to say it on one page.
- Insist that letters and memos be neat. It saves reading time at receiver's end.

Don't . . .

- Use stilted formalities. Forget expressions like: "Your esteemed favor of the 1st inst. to hand . . ."
- Use superfluous words: "Enclosed herewith please find . . ." Say: "Enclosed is . . ."
- Beg or advise. Why crawl? Why preach? Tell or inform.
- Attempt legal lingo. Plain, informal English is more natural, puts your ideas across faster.
- Try to be literary. Keep your language simple, direct.
- Declare ultimatums.

consider the nature of the group or persons with whom he is communicating and the barriers that may get in his way. Language that is clear to him may be obscure to the receivers.

Words or expressions that seem neutral to him may rub others the wrong way. When Bob Lynch, now president of Atlantic Steel Co., first joined that company he realized that as a northerner he would have to sell himself carefully to his associates. One of his first projects at Atlanta was the organization of a safety contest. In a pep talk to his team, Mr. Lynch, fresh from Ohio, assured the Georgians that their team would take the opposing team "like Grant took Richmond." Fortunately, his listeners, while momentarily shocked,

were both understanding and forgiving.

Motivating Others

Understanding is not enough. The communication must be accepted and acted upon. If it states clearly what is to be done and inspires the recipient to want to

do it, then, says Mr. Fischer, we have truly communicated.

That is basic in every situation requiring teamwork. It is particularly important when the communication threatens established ways of doing or ways of thinking.

The morale of an organization, and to a considerable degree its productivity, depend on the communication process. Employees who know what is expected of them who know how their work ties is with the company objectives and who learn about changes before they take place will work with more enthusiasm.

Measuring Effectiveness

Just as communication often suffers from lack of planning, so i suffers from failure to evaluate it effectiveness. Much has been learned about why some conferences succeed and others fail, why some memos are clear and other obscure, why some talks get results and others cause indifference

It is not enough to talk. You also must listen to find out how good your communications are.

Many devices, other than directlistening, are good sounding board—attitude surveys, skilled depth in ter viewing, rumor clinics, grip boxes. Effectiveness often can be measured by production records absenteeism and turnover.

But the most important device is the positive listening attitude

George Nelson of George Nelson & Associates, New York, believes the biggest problem in business communication is that of feedback—getting communication back from the person or persons you are trying to influence. Without feedback, the effect of the initial message cannot be measured, there is no information to guide further action.

Like many industrial executives Mr. Nelson feels his experience in communication has been fragmentary and tantalizing. Much remains to be learned before a bridg of understanding can be built between management and labor, between superior and subordinate.

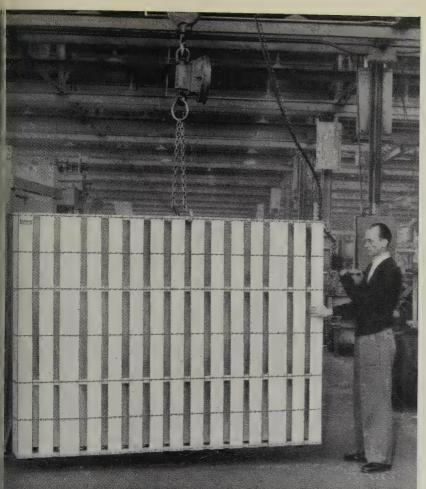
Better communication is a continuing challenge to management at all levels. It is a challenge because perfection never will be attained. Yet there are deep satisfaction and tangible rewards for the management man who can influence others. To extend your skin communicating:

Clarify your ideas. Obtain participation. Talk or write as simple and clearly as possible. Seek a ceptance and action by others. Litten to determine your effectiveness.



The ten commandments of communication Thou shalt:

- I Seek to clarify your ideas before communicating.
- Il Consult with others in planning communications.
- III Consider the social climate, as well as the specific situation, when you communicate.
- IV Examine your own true purpose in each communication.
- V Be sure you respect those with whom you communicate.
- VI Consider the tone, as well as the content, of your communication.
- VII Be sure that each message includes help for the receiver among its objectives.
- VIII Always seek to understand, as well as be understood.
 - IX Follow up your communication to find out what it meant to the receiver.
 - X Communicate for tomorrow, as well as today.



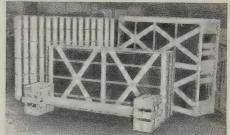
of four General Wirebounds, this one, containing two 100-pound ed door wings, is ready for shipment from the Evansville, na, plant of International Steel, largest revolving door maker.



Here are curved enclosure walls. End pieces bolt on, prevent shifting in transit.



Wirebound mat is laid out on floor, wrapped around end pieces, secured quickly by wire rock fasteners.



Four crates total 1,044 pounds—396 pounds less than before, take only half the time to pack.

Revolving door costs turned sharply down by General-Engineered Wirebounds

Shipping a revolving door means packing heavy, costly precision parts—a round ceiling piece, curved enclosing wall, glazed door wings, and an eightfoot shaft with large bearings at each end.

International Steel Co., Evansville, Indiana—the leading manufacturer of revolving doors—ships many per year, is keenly cost conscious. General Box engineers, working with International's Manager of Shipping, recently came up with wirebounds that cut shipping weight by 396 pounds and cut packing time in half, compared with the custombuilt nailed crates formerly used.

Total savings from use of the new containers are expected to amount to at least \$10,000 a year. As

International's management is well aware, it would take a lot of sales to boost profits that much.

General has the testing facilities and the experience to help your company make this kind of progress, too. And it costs nothing to find out what the possibilities are. Just let us know where you are and what you ship. We'll send a man. And ask for your free copy of illustrated booklet, "The General Box."

Factories: Cincinnati; Denville, N. J.; East St. Louis; Detroit; Kansas City; Louisville; Milwaukee; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston.

Engineered Containers for Every Shipping Need

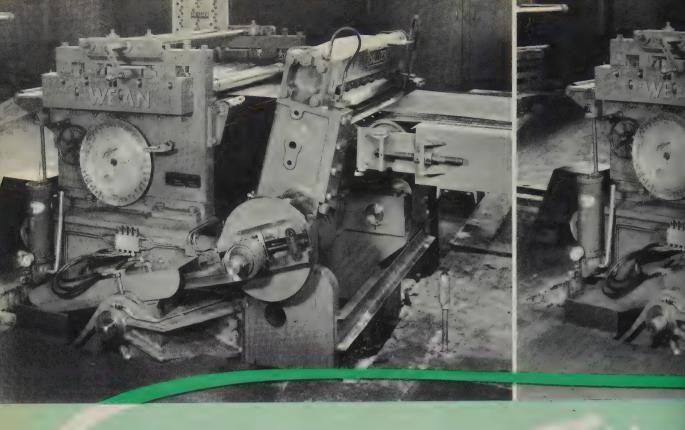
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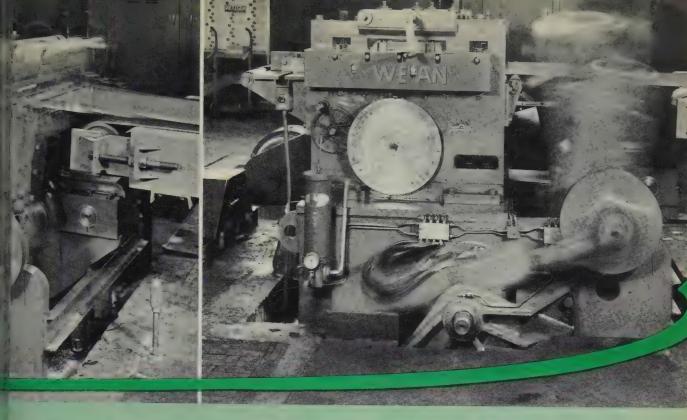
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hundred cuts per minute to reed tolerances . . . that's what of the amazing new Wean ment Flying Shear and Slitting in are getting. That's why, if e using steel in sheet form, it's tant to you to get all the facts.

urchasing steel in coil form inimize the mill extras — that imes amount to more than per hundred weight. You reconsiderably both the perl required to handle and inry large steel stocks and the needed to store various cut

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There's no comparison! The Wean Combination Slitting and Shearing Line is absolutely the last word in speed, precision and automatic operation. Before you buy let a Wean Equipment man show you one of these lines in operation. Talk with the operators. You'll be convinced. Simply contact the Wean office nearest you. They're listed below.

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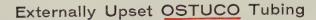
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STEEL

May 16, 1955

Technical Outlook

JEW SAVINGS—You don't have to use metal lowder parts in large volume to take advantage of cost savings. That's what B. I. Horton, methods engineer, Pitney-Bowes Inc., Stamford, John., told the Metal Powder Association in Philadelphia last week. This is particularly true if design is considered. Pitney-Bowes uses 5 structural powder parts. Quantities range rom 1000 (or less) to 10,000. Cost savings using alternate methods of manufacture for omparison) average 70 per cent.

SUPERTHIN TITANIUM—Can you use commercially pure titanium in thicknesses down to 0.0005 in.? American Silver Co., Flushing, N. Y., calready has rolled sheet down to 0.0008 in. in commercial quantities, and it believes it will be making the thinner product soon.

HEARING WEAR— Hook up a microphone to a gear box and listen to the gears wear. There's a correlation between change in gear noise and the beginning of gear pitting, says International Nickel Co.

Germany, a process utilizing only 75-per-cent-pure oxygen blown into the hot metal before it is charged into the open hearth shows promise. Object is to reduce silicon by about 0.5 per cent—it also can reduce carbon by more than 2 per cent and sulphur and phosphorus by considerable percentages. Tap-to-tap time is down 12 to 15 per cent. This could be a logical step in any trend to 100-per-cent oxygen steelmaking.

BETTER BRAZING—You can get a shear strength of 48,000 psi in a molten salt bath, or one of 63,000 psi in a vacuum furnace. NACA researchers at the Lewis Flight Propulsion laboratory in Cleveland make the report. With

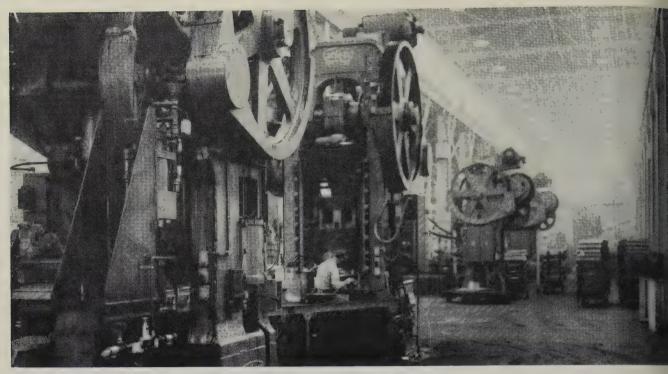
molten salt, shear strength of braze increases as the bath temperature is increased, and variability of results is decreased. In a vacuum furnace, the best average strength is at 2075° F, with a 15-minute holding period. Published figures for hydrogen atmosphere brazing give shear strengths of only 42,000 psi.

VEST-POCKET TURBINE—A British gas turbine weighing 130 lb is finding uses as a prime mover for air compressors and electrical power generators. It puts out a steady 60 bhp on a 9gph diet of a wide range of distillate fuels and gases.

FOUR ACES—Metals playing the most important roles in atomic power reactor operation are uranium, thorium, beryllium and zirconium, says Henry H. Hausner, Sylvania's atomic energy manager. One of the major problems of using them in reactor design: The enormous stress caused by the intense heat of nuclear fission. It can separate a cladding from the fuel element unless an efficient bond holds them together. A great deal of progress is being made on better bonds, Mr. Hausner states.

TOO SMOOTH— Don't overspecify on surface finish, cautions a Westinghouse engineer. Surfaces that are too smooth, when running in contact, may freeze together because of molecular adhesion.

RUST PREVENTIVES—Aircraft engines dusted internally with a vapor-phase rust inhibitor and treated with preservative oil survived two years of outdoor storage on tropical islands. They needed only minor repairs to be put into working condition. Engines protected internally by oil alone rusted badly in three months. The inhibitor was composed mostly of amine nitrites.



Short-stroke presses like these do the blanking, perforating and forming of the cartridge tube

Cartridge Making on Standard Machines

Multipiece design puts recoilless shell production within bidding of a greater number of shops. Standard, shortstroke punch presses are the key tools

By R. J. WILCOX executive engineer Motor Wheel Corp. Lansing, Mich.

THE ARMY'S new, hard-hitting, 106-mm recoilless rifle can knock out any tank in the military world.

What the government wanted was a production technique so standard that just about anybody in metalworking could turn out cartridge cases for it.

That's where multipiece design comes in. With the coming of this new gun, the feasibility of using multipiece design to make cartridge cases became more important. Motor Wheel Corp., Lansing, Mich., got the job of pioneering the manufacture late last year. Here's what came out of that work,

Commercial Materials — Standard, cold-rolled commercial sheet

is sheared to develop blank size and shape. Conventional, short-stroke mechanical punch presses are used, two strokes per blank—putting 1160 holes (5/16-in.) in a predetermined pattern in the blank.

The perforated blank is trimmed to a developed contour and formed into tubular shape in three die operations—all of which are performed in short-stroke presses of the most common type. After tubes are washed, they go to one of two, direct-current, submerged-arc welding units.

Welding—Designed to operate as individual units, each welder has two stations which can be used singly or simultaneously. Weld

per cent. Waste tabs are placed each end of the tube to elimination burnout at tube ends.

After welding, waste tabs a removed. The seam weld is scarl in a flash-trimming machine a tested in a hydraulic expandifixture. After re-sizing and waing, the tube is ready for assemble

Tube-Head Assembly — Witubes are made, the head is roumachined from a C-1117 forgon a spindle automatic lathe. Toperation calls for turning the pidiameter, drilling the primer hand rough facing.

Tube and head are assembly with a press fit in a hydraulic



tubes are welded and sized, tube and head are assembled in a hydraulic fixture before brazing

hydrogen-atmosphere furnace. Passembly is re-sized in a conconal-type mechanical punch utilizing dial feed for ease in and unloading.

ish Up — Washing and heat ging follow. The latter comm in one automatic unit a hardg furnace, brine quench, mouth al and draw to Rc 30 minil, followed by cold and hot s. Then the assembly is sized tapered to finish form dimen-

Ir the next operation, the asoly is chucked on the OD at lenter portion of the case, piloton the ID of the mouth end. leaves both ends exposed for ltaneous finish machining on light gle-spindle lathe.

maining operations: Taper ing of the primer hole on a e-spindle drill press, final intion, marking and varnishing protection.

technique that could be apreadily in a large number of ing metalworking operations nemergency, Motor Wheel disred other advantages. They de: A production rate greater that afforded by deep drawand appreciable savings in mals and process time.



Then comes washing and heat treating before the final sizing and tapering to finish dimensions



Both ends are finish machined simultaneously on a single-spindle lathe. Primer hole reaming is last production job

As a testing method it has some aces up its sleeve.
One of them is its skill as a thickness tester—another is its ability to tell nodular from gray iron



Wall thickness of these gas cylinders is checked ultrasonically. It's part the quality control system at Taylor-Wharton Iron & Steel Co., Easton, Cylinder is mounted on a rack for rotation

Ultrasonics Makes Itself Heard

ARE YOU doing all you can with ultrasonic testing? Surprisingly versatile, the method that got its start as a detective looking for subsurface flaws has much to offer as both a quality and a dimensional checker.

Now you can measure wall thickness and check for corrosion or erosion loss on pressure vessels, cylinders, etc. Ultrasonics also can be used to check metallurgical structure.

Vibrations—In thickness measuring for example, the method works like this. A high-frequency oscillator, usually operating somewhere between 0.5 and 10 megacycles (mc), sends its electrical impulses through a piezoelectric transducer. (Piezoelectricity is due to pressure in crystals.) This transducer converts the electrical impulses into continuous high-frequency sound waves that are sent into the part under test. Frequency of the waves can be varied so the wave lengths also vary.

When the thickness of the metal is a half wave length, or a multiple of it, the metal will resonate. This increases the loading on the By PETER K. BLOCH
Branson Instruments Inc.
Stamford, Conn.

transducer which increases the plate current on the oscillator. When the increase is detected, it can be read as thickness in inches. The detector may be a set of headphones, a meter or an oscilloscope.

Visual Conversion—On the oscilloscope indicator the horizontal base line represents a frequency range, such as 2 to 4 mc. If this frequency range includes resonant frequencies for the material thickness, vertical lines appear on the screen at the appropriate frequency. Removable calibrated scales, placed in front of the cathode ray tube, make it possible to read these lines directly in terms of thickness.

Plate thickness is inversely proportional to the fundamental frequency. High frequencies generally are used for thin sections, low frequencies for thick materials.

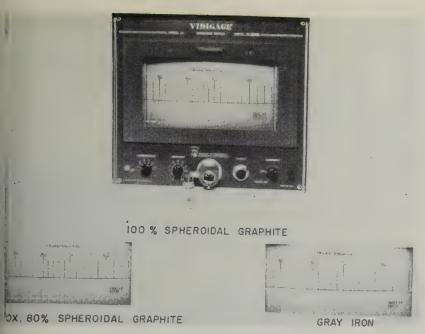
Broadened—Use of an electrically variable inductor in the oscillator circuit, and a 21-in. television tube, has increased the usefulness

of ultrasonics for shop and finspections. The small plus sweep oscillator containing variable inductor, can be separed from the main chassis by tension cables 1000 ft or long

The thickness indication on 21-in. television tube is sufficiently bright to enable the operator check large structures, and rethe thickness from a distance 10 or 25 ft under shop condition

Ranges—The sweep of the value inductor can be varied of tinuously over a wide range. In turn adjusts the frequency thickness range of the gage. I adjustment makes it possible design an almost unlimited ray of thickness scales for optim performance on a specific applition.

High precision, in the order 0.1 per cent, is readily obtain over a limited thickness range measurements within 1 to 2 cent can normally be experimental a wide range is covered Since sound velocity is only slilly affected by small changes chemical composition, the second can be used over a factorial control of the second control



in indications on the oscilloscope show difference between nodular iron and iron.



Instrument checks for corrosion loss in used gas cylinders

range of alloys. For example, seel scale can be used on carsteel, stainless steel, Inconel, el, cast steel and ductile iron. hile steel scales can be used rough measurements on alum, it is better to use special s. Another scale would be for copper and most brass bronze alloys.

here—Ultrasonic gaging imiately after extrusion is a tical method for complete intion of extrusions and rejectof excessively eccentric secs. Gross discontinuities are iltaneously detected. High and limits and limits for eccentry can be marked on the e, so the inspector can readdetermine acceptability.

un barrels, propeller shafts high-pressure steam pipes are uently bored from solid forgor rough castings. The cutmay run off center, resulting variation in wall thickness, average weight of the tube still correct, and it may also static balancing tests.

his variation in wall thickness be detected with ultrasonic ipment, during the machining cess, or after installation.

number of defective propeller fts, which were covered with n. of rubber on the outside, e tested successfully after inlation by applying the transducer to the inside, and spiraling it through the section which is 50 ft long.

Narrow Range—In many cases the thickness of the part is already known within plus or minus 0.020 in., so a scale covering a narrow thickness range can be used. The narrow range scales can easily be read to 0.1 per cent.

Wide Range—Jet aircraft wing sections utilize integrally stiffened sheet, sanded and milled to close tolerances. The sheets are large, making mechanical gaging difficult. Over 100 inspection points, ranging from 0.050 to 1.7 in., may be located on a single sheet.

Ultrasonic gaging from one side, within ± 0.002 in., is possible by using a large number of scales, each scale covering a band width of 1/k-in.

Structure — All ultrasonic test instruments are affected by internal properties of the material. In general, highly worked, small grain-size materials transmit well at high and low frequencies; gray iron castings generally transmit only at low ultrasonic frequencies, around 1 or 2 mc. Strength of the resonance indications at various frequencies is a good measure of the ability of the material to transmit the ultrasonic waves.

For example, it is easy to distinguish between gray iron (flake graphite) and ductile iron (sphe-

roidal graphite) by observing resonance indications at relatively high frequencies, such as 5 to 10 mc. Gray iron gives no indications at all; ductile iron gives strong signals across the whole band. Intermediate grades, such as 80 per cent spheroidal iron, will produce fairly strong resonance indications at the low frequencies around 4 or 5 mc, but no indications at 9 mc.

Flaws — Ultrasonic waves are reflected by metal-air or metalliquid interfaces. Thus, it's possible to pick up laminar discontinuities within the metal and lack of bonding between two materials. While the equipment generally is not capable of detecting minute discontinuities, it will detect discontinuities with an area of ½-sq in. in the plane of the test surface.

Lamination or "pipe" in tubes and sheet is detected by a sudden change in the indication. Laminations frequently are close to the center of the thickness, since they may be produced by insufficient cropping of the ingot, or by edge-overroll in sheets.

Centerline lamination is detected most conveniently by setting up the instrument to produce three or four indications on a sound section. When there is a lamination, every other indication will disappear, indicating half thickness.



CHEMICALS are milling more than 70 aircraft parts at North American Aviation Inc., Downey, Calif. Aeronca, Boeing, Beach, Grumman, Lockheed, Northrup, McDonnell and Rohr are using the same process.

"Chem-Mill" is its proprietary name (licensor is Turco Products Inc., Los Angeles). It's a method of controlled depth etching with these important advantages:

- 1 It can be done after forming.
- 2. It is not limited (as conventional milling is) by shape of part, direction of cut or cutter radius.
- 3. It is applied easily to complex contours.
- 4. It can mill both sides of a part at once, avoiding warpage.
- 5. It permits great versatility in design, especially of integrally stiffened structures.
- 6. It is fast, because it can work on many areas at once.
- 7. It can hold close tolerances: ± 0.002 in. is possible, ± 0.003 is routine.
- 8. It makes tapering sheets and tubes an easy job.
- 9. It permits varied depths of cut.
- 10. It needs no highly skilled operators. The process lends itself to automation.

11. It yields a surface that requires no finishing or polishing. There's no problem of notch sensitivity. Surface finish is 45 rms minimum.

12. It uses conventional cleaning and pickling equipment. If you have that, plus a spray booth and a drying oven, you're in business.

Clincher—And it's inexpensive. North American says that one chemical milling installation costing \$30,000 can do the work of three milling machines costing \$600,000 on the right kind of jobs. Biggest use now is on thin panels, but it can do excellent work on forgings, deep-drawn parts and tubing.

When castings are chemically milled, some objectionable cratering may develop where the etchant bites into the pores, but don't rule out castings as a prospect.

How It's Done—Since this is an etching process, parts that aren't to be eaten away must be masked. This can be done by mechanical masks, adhesive tapes, sprayed or brushed organic coatings, silk-screen printing, photosensitive coatings or plating.

A widely used technique at North American is to cover a panel with masking tape. Using a template as a guide, a worker of through the tape with a knileaving it only on areas to etched. The entire panel is spray with a latex coating. When t rest of the tape is stripped, leaves bare metal areas surrour ed by paint-protected areas.

The etch has a tendency (which can be closely controlled) to a dercut the mask. Allowance made for this action in the ten plate.

Etching Bath—For aluminum strongly alkaline etching bath used. It is enhanced by additito produce a smooth surface, uniform etch with good fatige characteristics and thorough with ting. Etching rate is 1 mil a mute.

Resulting by-products are drogen and alumina. The hydgen is disposed of by convention tank venting equipment and cobe recovered. The precipitates recovered by filtering or settli

Sequence—Parts must be clear before masking. They go throu a solvent degreaser, hot alkal cleaner, cold water rinse, chron acid dip and hot water rinse. They go to a preparation area masking.

After masking, parts go throu

etching bath, cold water rinse, it removal bath, mask removal of (or hand mask removal) and nal hot water rinse. Parts to taper etched go to a deep k in which they are raised or cered gradually by a timeritrolled hoist. Length of time on to raise or lower the part formines the degree of taper.

riming—Controlling depth of it is simplicity itself. A fuse, ectly the thickness of the metal be eaten away and of the same iterial is connected to an electral circuit and placed in the with the part. When the fuse eaten through, it opens the circuit, actuating a warning device or hoist which lifts the parts in the bath.

In accessory method makes use dadhesive tape. It is stripped ay on a timed sequence to duce varied depths of etch on a same part.

Etching's Place — The phototiphs give a good picture of the resatility of chemical milling. It is a superior job on integrally affened and tapered panels. It is last, accurate method for thining the webs on forgings. If deed, the entire forging can be added oversize and etched to final mensions without masking.

There's no doubt that in the airift plants chemical milling is king heavy inroads. For jobs which mechanical milling is w or difficult, chemical milling is a bright future. It suppleents and extends milling's range the nonferrous metals. What it ill do on steel remains to be seen.

Extra copies of this article are available quantities from one to three until supply exhausted. Write Editorial Department, EEL, 1213 W. Third St., Cleveland 13, O.



indwich panel. Ducts can be etched,



Masking duct skins for the F-100 Super Sabre. Skins are masked and stripped after the part is formed



Spraying masked duct skins. When the paint dries, masking tape will be removed and the part etched



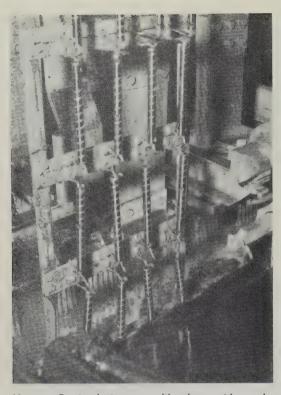
Inspecting the finished product. Production tolerances are ± 0.003 in. for chemical etching



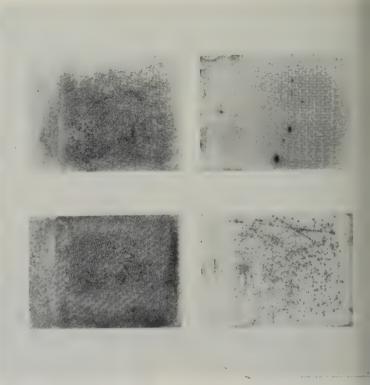
Thinning metal by etching after drawing prevents tears



Forging reduced to specifications by etching



Maytag Co. is plating parts like these with crackless chrome



Ordinary (left) and crackless chromium (right) on steel—after fi months outdoors. Plating: Top, 0.0005 in.; bottom, 0.0002 in.

Crackless Chromium Foils Corrosion

CHROMIUM plated directly on steel has gone to work for the Maytag Co.

The company is using a 10-step process devised by United Chromium Inc. to plate matte chrome on 15 automatic washer and dryer parts. It by-passes the customary copper plating, nickel plating, buffing sequence and gets around recurring nickel shortages.

No Cracks — Final dividend shows in the name of the process, "Crack-Free" chromium. Bright chrome surfaces have minute pores and cracks, says United Chromium. A surface without them won't let corrosion get started.

Maytag engineers tested the surface for wearability. Their decision: It makes a wear-resistant surface as good and possibly better than those chromium plated by other methods.

Exposure to 100-per-cent humidity at 120°F for a full year produced no effect on 0.3 and 0.5 mil chrome on steel.

Catalyst—Core of the process is a new-type catalyst. It is used in a chromic acid bath.

The bath automatically regulates the concentration of catalyst. It has good throwing power; plating speed is about the same as for ordinary chromium.

Production—Maytag is using a chainless return-type automatic plating machine. The cycle includes anodic cleaning, anodic etch, plating and soluble oil dip, with rinses and sprays after cleaning and plating. At full capacity the line will take 25,000 to 30,000 amp at 8 v.

Plate 0.2 to 0.4 mil thick is deposited in 18 to 20 minutes. This is a little better than 0.9 mil per hr at a current density of 3 amp per sq in. Temperature is held at $150\pm1^{\circ}F$.

Parts up to 17 in. long and $1\frac{1}{4}$ -in. in diameter are being plated. Except for a copper pivot, all are steel.

Finish before plating is 30 to 50 rms; after plating, it is 3 to 7 rms.

Still New—Since 1953 when the process was announced, manufacturers of calculating machine steam boilers, aircraft hardway tools and dies, hydraulic cylinder and steel tubing have been trying it on a pilot scale. Maytag fi ished a year's pilot run and we into full production in Februar

A silverware manufacturer plating embossing dies by the ne process. He reports 20 per ce longer die life. A manufactur of aluminum tumblers eliminatisticking and seizing in his draing dies by plating them. A statubing producer is considering using the process, then buffing fa bright finish.

Decoration — Automotive approactions can be expected if the coordinate of buffing to a bright polish provide enough. The coating is set to buff easily, much like denickel plate.

A two-tone finish—the natural light - gray, matte finish with buffed highlights—is being us for furniture hardware.

NGERSOLL-RAND BOILER FEED PUMPS

Serve Steam Plant at

. S. Steel's New Fairless Works

S team, though not an *ingredient* of steel, is vital to its production, heating buildings and pickling lines, generating electric power and driving I-R pumps and blast furnace blowers. The steam plant at U. S. Steel's New Fairless Works rivals many a large central station for size, efficiency and modern equipment.

Its high pressure boilers, for example, are served by five Ingersoll-Rand Class CHTB, 7-stage boiler feed pumps, two of which are shown below. Each delivers 700 gallons of 240° boiler feed-water per minute at an intake pressure of 17 psig and a discharge pressure of 1042 psig. A steam turbine driven unit is shown in the foreground, while the pump at the rear is arranged for dual drive, either by direct-connected electric motor or steam turbine.

When it comes to boiler feed pumps, Ingersoll-Rand's experience is second to none. Why not let this know-how help you save time, effort and expense on *your* next installation. Ask your I-R representative or branch office for complete information.



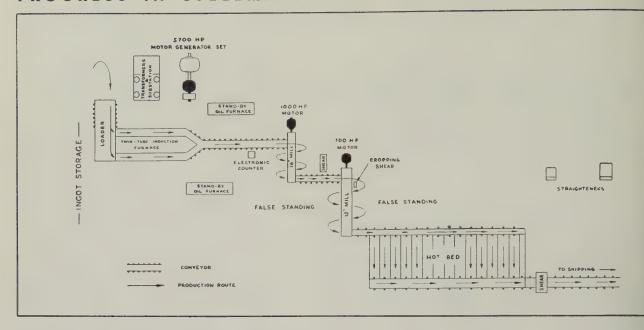
PUMPS • COMPRESSORS

RBO-BLOWERS • AIR & ELECTRIC TOOLS

ROCK DRILLS • VACUUM EQUIPMENT

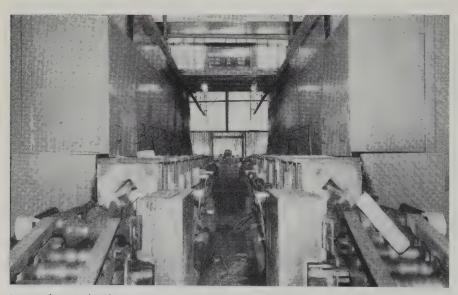
Ingersoll-Rand

11 Broadway, New York 4, N. Y.



This mill's costs are down and production is up now that . . .

Induction Heats the Ingots



Ingots leave the heating coils in a steady stream, first from one side then the other. It takes 10,000 hp of energy to power the coils

DUAL-FREQUENCY induction heating of ingots at the Vancouver (B.C.) rolling mills of Western Canada Steel Ltd. broke the heating bottleneck. Improved finishing facilities couldn't be operated at capacity with existing furnaces.

Factors influencing Western's decision: Low-operating costs and the promise of high-quality finished

products. Despite the high initial investment (slightly over \$500,-000), company officials are convinced they made the right move.

Cuts Scale Losses—One feature that weighted the balance in favor of induction heating was the reduction in normal scale loss experienced in conventional heating furnaces. It used to average be-

tween 3 and 5 per cent, now i less than 2 per cent. This alo accounts for a saving of abo \$1.50 a ton.

Something less than 10 minut elapses from the time a cold ing enters the plant until it is a fi ished bar on the hot bed. No mothan 8 tons of ingots are in process at a time, which makes for highly flexible, merchant mill operation. The furnace can be start or stopped practically at the tour of a button.

Two Units—To keep down over all length, the unit was design with two identical parallel tunner. This adds flexibility, since eith side can be operated independent

Heating takes place inside to coils which have been heavily is sulated and cast in a plastic refratory of high density and strength High-silicon ceramic liners keingots from abrading the refratory. Since heat is generated within the ingot, it is possible to ke the furnace structure and even to outside surfaces of the tunnecool.

Power Consumption — For t largest ingots, it takes 300 kw-



Basic Refractories not only furnishes its customers with the finest refractories available, but also employs skilled craftsmen—men with practical steelmaking experience—to insure that the use of these products gives full value.

BASIC REFRACTORIES INCORPORATED CLEVELAND 15 OHIO





How About

Pearlitic Malleable

Specify Pearlitic Malleable Castings

FOR STRENGTH WEAR RESISTANCE MANUFACTURING ECONOMY

Pearlitic malleable is a specially processed malleable iron. It possesses an unusual combination of toughness, ductility and machinability.

- Pearlitic malleable has exceptional bearing properties—in many applications allows the elimination of brass or bronze bushings.
- Pearlitic malleable has high yield strength, from 45,000 to 80,000 psi to meet your requirements.
- Pearlitic malleable is easily machined and has excellent finishing qualities readily acquires a smooth mirror-like finish.
- Pearlitic malleable can be selectively hardened by flame, induction or immersion methods for even greater wear resistance.

Write to the Malleable Founders' Society for names of foundries that make pearlitic malleable castings and for complete specifications.



Small Engine Crankshaft



Automotive Rocker Arm



Diesel Engine Piston



Universal Joint Yoke



1800 Union Commerce Building

Cleveland 14, Ohio

a ton or better, including all loss Rate of output varies from 20 25 tons per hour. With small ingots, average power consumpti is higher and the rate of flat somewhat less.

One of the most striking feature is the heatup speed. Here are defor the various ingot sizes:

		Outp
Size	Time	(tons
(in.)	(minutes)	hr
$4 \times 4 \times 36$	3.6	15
$4 \times 4 \times 42$	4.25	15
$5\frac{1}{2} \times 5\frac{1}{2} \times 43$	4.75	20
$5\frac{1}{2} \times 5\frac{1}{2} \times 45$	5.0	20
$5\frac{1}{2} \times 5\frac{1}{2} \times 56$	5.50	20
$6\frac{1}{4} \times 6\frac{1}{4} \times 49$	8.4	20

Four men operate the furna Higher production will not requ a larger crew. Working condition have been improved considerab

The Operation—Fork-lift true bring the ingots from stockpi to the walking-beam table. Ingare spread out and advanced another table fitted with flat, ruber conveyor belts which car them forward to the feeders.

More automatic handling equiment carries them one at a tifrom this point to the feed trough A hydraulic ram pushes them in the heating tunnel. The line of gots is continuous. As one pushed in, a hot one emerges from the discharge end. Interlocks we the two lines in step, so that in feed is timed properly for mill compation.

Power Supply—About half power consumed is applied to line at standard, 60-cycle frequey. To achieve best efficiency, balance is converted to a higher frequency in a generator driby a 5000-kva synchronous motors.

A total of 7000 kw of energy required. The 540-cycle energy supplied at 400 v, the 60-cycle 550 v. Power comes from British Columbia Electric Co. I to three, 3000-kva, water-cootransformers for step down fr 60 ky to 4 ky.

The heating unit was built General Engineering Co. Ltd., ronto, Ont. Only 75 per cent the furnaces' ultimate product capacity has been realized, but fore the year is up, Western pects to boost production and heating costs even further as of ators become more familiar with equipment and its operation



GREENLEE special-purpose machines for <u>profitable</u> mass production

Master brake cylinder machined on above Greenlee Special Machine. THEY SAVE WORK...THEY SAVE MONEY

If you are being outdistanced in today's swift race for production... faced with narrowing profit margins...it will pay to investigate Greenlee Special Machines. Savings effected on drilling, reaming, boring, counterboring and tapping operations will quickly amortize your invested dollars.

> (Above) Greenlee Horizontal Indexing Machine designed for processing master brake cylinders has proved itself with raised quality and lowered costs.

> (Left) Greenlee Two-Way Horizontal Indexing Machine equipped with Power Clamping and Automatic Unloading increased previous production rates and lowered costs.

Wheel cylinder machined on Greenlee Special Machine shown below.

GREENLEE

GREENLEE BROS. & CO.

1925 MASON AVENUE ROCKFORD, ILLINOIS

VRITE FOR COMPLETE INFORMATION



BRIDGEPORT'S HIGH I. Q. BRASS means production savings

The right grain size can often mean the difference between a poor finish produced at high cost and a gleaming, lustrous finish made at substantial savings. This is one of the *High Inner Qualities* you can count on in Bridgeport sheet and strip brass. Bridgeport offers a range of grain sizes . . . can help you select the right one, combined with other inner qualities, to boost production and lower costs.

Our nearest sales office will be glad to show you how to profit with Bridgeport sheet and strip. Let us put Bridgeport *High I.Q.* to work for you today.

Bridgeport folder
on grain size,
"The 4th Dimension,"
will be sent
to you on request.





BRIDGEPORT BRASS COMPANY & BRIDGEPORT, CONNECTICUT

In Canada: Noranda Copper & Brass Limited, Montreal

Offices in principal cities. Conveniently located warehouses.

Sommet Seating Tool

will handle most contact armgements, and it can be enapted for smaller parts

NEW TOOL for seating connecting grommets is speeding operates in the electrical manufactural department at Convair, Ft. 1974, Tex.

The grommet fits onto the back the connector (wires are threadthrough it) to seal the uninated solder pots from humidity of vibration. Grommets used to iforced into seat by hand, resultin many rejects because of bken insulation and torn gromts.

Foot-Operated — The tool now ed is similar to a vise. It has movable back jaw, padded with ober sheet. Fixed parallel metal ates, like fingers, make up the ont jaw. Pressure on a foot pedal oses the vise through a pulleyble arrangement.

Connectors, which are of flexiblesert type AN, are prepared by reading the wires through the ommet and soldering them to eir respective solder pots in the nnector contacts.



FOOT-OPERATED VISE
... makes grommet seating easier

Seating — Then, the operator claces the connector against the ace of the back jaw, fits the wirner harness through the parallel clates and, with steady foot presure, closes the vise. The grommets forced to seat without damaging the wires or the grommet.

Spacing of the metal plates is ommon to most connector wiring rrangements. But it can be varied a handle smaller components.



NILSON 4-SLIDE TAKES A TOUGH ONE . .

Mass production of body trim clips for a leading make automobile proved a complex forming problem. A. H. Nilson's 4-Slide (Model S-4-T) did the job, forming .025" x 3", 1065 C.R.A. steel at 54 strokes per minute! Accurate, fast, and automatic, Nilson 4-Slides keep pace with one of the nation's biggest industries.



THIS ONE WAS EASY . . .

A Nilson 4-Slide, Number 1, forms 150 drapery hooks per minute from 0.70 basic steel wire. Nilson 4-Slides form wire or ribbon stock from the coil. They straighten, feed, pierce, blank, swage, stamp or coin, cut and form in one, fast, automatic operation . . . accommodate wire up to .5" dia., in feeds to 32" max., and ribbon up to 3.5" wide. Press sections from 5 to 75 tons.

A. H. Nilson provides forming recommendations from detailed information without obligation. Send for catalog.



1512 RAILROAD AVENUE, BRIDGEPORT 5, CONNECTICUT

Automatic Chain Making Machines : Staple Forming Machines : Wire Stock Reels
Wire Straightening Equipment : Slide Feeds for Presses : Wire & Ribbon Stock Forming Machines



Take an alloy
that doesn't like
to be pushed around
and work hardens
at the drop of a hammer.
Pull it slowly
and you can coax it
into shape

It fits. Hand pressure is enough to mate the part to the gaging fixture

Titanium Stretch Forming: Easy Does It

WHEN IT COMES to forming, titanium can be stubborn.

The people at Cyril Bath Co., Solon, O., are pulling some of the orneriest and getting away with it. It's Rem-Cru's A-110-AT, a new alpha-type titanium, with 5-Al, 2.5-Sn as alloying elements. What makes it so tough is that its minimum yield point, 110,000 psi, sits right on top of its minimum tensile point, 115,000 psi (typical elongation, 18 per cent in 2 in.).

Over-Reach—What's more, Bath is forming the stuff on a 50-ton radial draw former. It's the biggest former in the plant, although the company makes them bigger.

While it's nice to demonstrate that your equipment will outperform its rated capacity by 10,000 lb, performance in this case is more important as a demonstration of stretch-forming technique. It shows that beef isn't the whole story.

Rule of Thumb—When you are cold forming titanium the rule is: Take it slow and easy. More than for most other metals, titanium's yield strength is a function of strain rate. With a slow pull, it stretches; with a fast pull, it breaks.

Although Bath is primarily an equipment manufacturer (radial draw formers, press brakes, tangent bending sequence presses), the

company also does contract forming for the aircraft and truck trailer industries. This titanium job is a jet engine part.

Strip Tease—It starts as a pier of 0.096 strip, trimmed to about 8 x 75 in. Edges are rounded by grinding to eliminate potential points of notch weakness.

As formed, the part looks lil half a cylinder of 3 ft diamete shifting abruptly 8 degrees to ha a cone. To make it, one edge the strip has to be stretched $2\frac{1}{3}$ in. more than the other.

The transition between cylind and cone must be straight at true. That rules out forming the 8-degree bend first on a pre-

wave and wander in stretching. The bend has to be formed by setching and ironing around a which is the shape of the fined part.

Former—The radial draw former st applies longitudinal stretch bout \(^1\fm_4\)-in. for this part) with hydraulic puller. Then the part radially stretched by wrapping around a die mounted on a reliving table. At the same time, a part is ironed against the die a bronze wipe shoe under 15 ns of pressure. It's all done at a slowest machine speed.

Besides objecting to being retched, A-110-AT is also hard tockwell C 30-35 at room temperure). The teeth on the gripper ads of the forming machine on't bite into it. Bath is solving at by lining the gripper teeth the emery cloth. Most of the ne it holds. When it doesn't, the pe shoe keeps the metal from ying.

Relax — After being stretched ound the die, the part is held



/raparound begins. While the pivoted ension head holds the metal tangenal to the die, the die rotates and the ripe shoe irons the metal against it

I full tension for several minutes of let it "set." When the tension is gradually released, the metal rotests with pops and groans. It is probably only friction on the ie, but it doesn't occur with other tetals. Any shrinkage is minor. The relaxed metal fits the die.

There's little springback. Hand ressure is enough to make the art conform to the gaging fixture.



MACHINE TOPICS

By R. F. HUBER, Machine Tool Editor

IF IT'S TRUE that the customer is always right, future machine tools will have it over present models on four counts.

First, they will produce to closer tolerances. Second, they'll turn out more parts at lower unit costs. Third, they will be both rugged and easy to maintain. Fourth, they will require an investment that's related to the work they'll do and to the cost of labor to run them.

Speaking at the spring meeting of the National Machine Tool Builders' Association in Chicago a week ago, Roger J. Emmert cited the above four over-all areas for improvement in machine tool design and performance.

From these, Mr. Emmert, executive in charge of the facilities and processes staff, General Motors Corp., got down to brass tacks. He reported that a recently completed survey of General Motors' master mechanics turned up the following.

Drilling Machines — Reduced maintenance was called for in 34 per cent of the returns; 27 per cent wanted better accuracy; 21 per cent called for greater flexibility and operating ease; and 9 per cent wanted better safety provisions.

The master mechanics also asked for more rigidity, more positive depth control and better spindle lubrication. They also wanted a standard spindle nose.

Milling Machines — Here they listed nine points for improvement: Greater rigidity and strength, centralized lubrication, better chip disposal, larger spindle nose, higher spindle speeds, greater spindle horsepower, better drives to reduce chatter, chip protection on moving parts, bearings and ways and the elimination of lubrication leaks.

They also asked for uniform location of T-slots on tables.

Turning Equipment—Here are the improvements GM's master mechanics want to be incorporated in the equipment that does their turning: More power, speed and rigidity, better chip handling systems, better methods of applying coolant and improved alignment of indexing mechanisms and turrets.

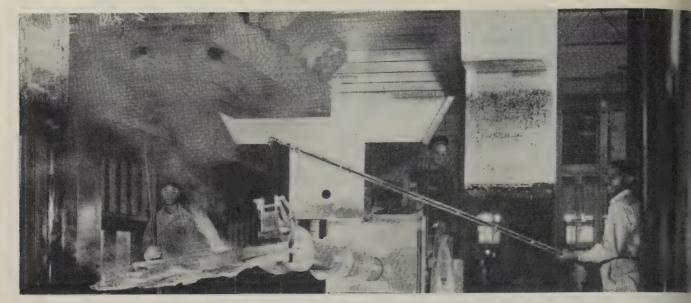
That, then, is what GM figures it will want in production equipment of the future. Interestingly enough, (it may be more than coincidence) their wants pretty well sum up the major trends in machine tool design.

Right, but Wrong

Two weeks ago Steel reported some figures as quoted from Arthur S. Flemming, director of the Office of Defense Mobilization. They were supposed to show that the 1 per cent per month rental rate formerly charged by the government for its machine tools was comparable to commercial practice.

The quote was accurate, but the impression was wrong. Government leasing has been conducted at rates substantially below commercial ones. That's the sore point—it puts the government in competition with both commercial machine tool leasing and machine tool selling.

131



Lubricant is applied with long spray pipe to die for forging wing spar as . . .

Harvey

Harvey

Curtiss-Wright

Heavy Presses Go To Work

THE LARGE flying forging was cleared for take-off when the Air Force dedicated its heavy press plant at the Cleveland Works of Aluminum Co. of America, May 5.

It's the first complete facility of the Heavy Press Program (see table) to get into operation. (Wyman - Gordon, North Grafton, Mass., dedicated its 35,000-ton unit last month. Its 50,000-ton press will be ready this fall.)

Dominating the 12-acre plant are two hydraulic presses which cost \$40 million—a 50.000-ton Mesta and a 35,000-ton United. They are ready to squeeze out precision forgings that will mean stronger, lighter and cheaper components for modern aircraft.

Economy—The large size of the forgings allows one-piece construction of airframe parts formerly made in several pieces.

Nonmilitary products are in the picture, too. Alcoa's president, I. W. Wilson said: "We hope to develop civilian products that can be made when military production is not filling press capacity."

There's Room - Air Force spokesmen said there's open capacity on the presses now. Barring all-out emergency, there should be continuing capacity for some nonmilitary production.

Education — Use of the large

forgings is expected to lag behind the ability to produce. You can't design parts for the production line until you are sure you can get them.

Forgings being turned out by

the big presses probably could be made by presses half as big. As designers gain experience and confidence in the large forgings, they will call for parts that will require the full tonnage of the big squeeze

Heavy Press Program Brought Up To Date

FORGING PRESSES							
Operator	Location	Builder	Press Tons	Operational Date			
Wyman-Gordon	N. Grafton, Mass.	Loewy	50,000	Aug. or Sept., 1958			
Wyman-Gordon	N. Grafton, Mass.	Loewy	35,000	Spring of 1955			
Alcoa	Cleveland	Mesta	50,000	May, 1955			
Alcoa	Cleveland	United Engineerir	35,000 ng	May, 1955			
	EXTR	USION PRE	SSES				
Alcoa	Lafayette, Ind.	Schloemar	14,000	May, 1954			
Kaiser	Halethorpe, Md.	Loewy	8,000	Sept., 1955			
Kaiser	Halethorpe,	Loewy	8,000	Sept., 1955			

Lombard

Loewy

Loewy

Torrance,

Torrance.

Calif.

Calif.

Buffalo

12,000

8,000

12,000

May, 1955

Oct. or Nov., 1958

Oct. or Nov., 1958



On a 10¢-per-gallon product, 6 CC of leakage per minute costs you about \$90 per year in unnecessary product waste.

REPLACE PUMP PACKING WITH

3

mechanical seals

Eliminate unnecessary stuffingbox leakage by installing a BJ Mechanical Seal. You not only realize important savings of pumped products but you also save on repacking and downtime losses. A BJ Mechanical Seal also prevents contamination of the pumped liquid ... protects against volatile and corrosive liquid hazards.



BJ MAKES A COMPLETE LINE OF MECHANICAL SEALS...

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ain Office, Alliance, Ohio 🖈 Pittsburgh Office, 1622 Oliver Building

 $lackbox{lack}$ Operating underneath the main overhead crane, this newly devoped, stiff-leg, semi-gantry, $7\frac{1}{2}$ ton Alliance Slab Handling Crane service the slab storage area of the building as it turns and positions here slabs on the scarfing bed.

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behind them, is continually developing new ways to give industry addition.

a frank discussion of your heavy material handling problems. Be preparative and tomorrow.

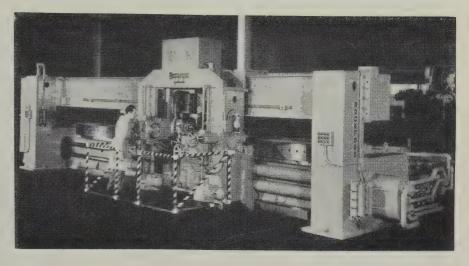
Plate Edge Planer Features Reciprocating Saddle

A new concept in plate planing made possible by a hydraulic laner whose saddle assembly toves over the work while the bed semains stationary.

The machine has a 14-ft stroke nd takes work up to 14 ft wide 7 in. thick. Attached to vertical olumns at either end of the bed a work clamp overarm containing hydraulic cylinders to operate our work clamp shoes. The saddle mounted on two vertical ways which are part of the bed.

The saddle reciprocates from 10 o 200 fpm. Right and left side ails, joined by a welded steel olumn top, carry the cutting tools. In the saddle seembly are two double-end, hyparalic cylinders which move with the saddle while the cylinder rods emain stationary with the bed and certical columns.

A dual control system enables he operator to control most sadtle movement and all head movenent from a stationary pendant or from a movable pendant on the



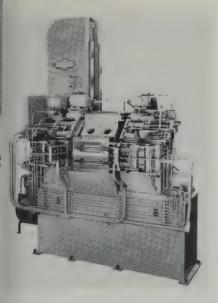
platform of the saddle. Both side head rails are equipped with handwheel-operated work locators. Conventional planer tools or sintered carbide ones can be used.

Each of the two hydraulically counterbalanced side heads has a hydraulic tool lifter. Head feed is hydraulic, and electric rapid traverse is available for any direction. A triple circuit permits three speed ranges and three force ranges. Any speed range may be selected and

adjusted to a direct reading tachometer by pushbutton control.

A saddle hydraulic system is built into the column top which is mounted on the two side rails. It includes motor, pump and necessary valving to operate the two heads. It needs only an electric power source to operate and is separate from the main hydraulic drive unit. Write Rockford Machine Tool Co., Dept. W, Rockford, Ill. Phone: Rockford 3-7611

Unit Broaches and Center Drills Automotive Axles



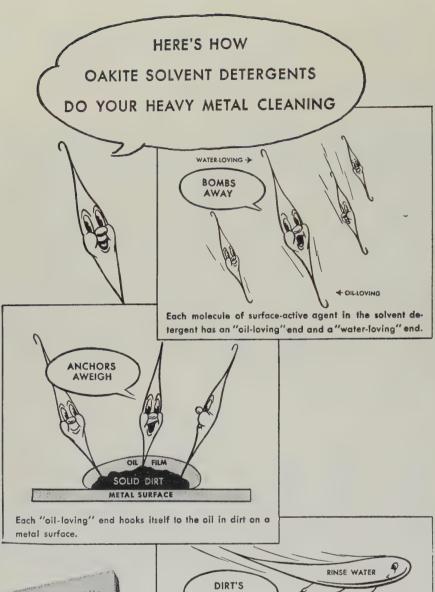
This broaching and centering machine is equipped with four, two-

station fixtures equally spaced on an indexing trunnion which operates on an eight-index arrangement. Two axles are broached to length while two parts are center drilled.

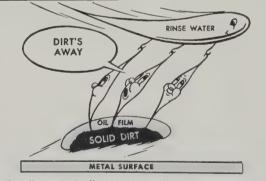
The operator unloads and loads two axles at the front of the machine as the parts rotate past. Axles are automatically clamped and indexed 45 degrees to an intermediate station. This allows parts already broached to swing clear at the back station so the broach can be returned to starting position. Parts previously drilled also unclamp as they rotate to an intermediate station. When the broach has returned to the starting position, the trunnion indexes another 45 degrees to present two

parts for broaching, two for drilling and two for unloading.

Tooling includes fixtures which hold two parts each and locate and clamp with equalizing jaws at both ends. Indexing mechanism is of the Geneva type, with final index obtained by a shock pin. Centering unit consists of two, two-spindle units mounted on top of the trunnion support on either side of the fixture, and electrically interlocked to the cycle. Parts are broached by surface cutters. The machine also has a motor-driven chip conveyor unit. It is designed for pit mounting, with the operator working at floor level. Write American Broach & Machine Co., American Bldg., Ann Arbor, Mich. Phone: Normandy 2-5621







Each "water-loving" end hooks itself to rinse water. Results Solvent, oil and solid dirt are swept away in the rinse.

Oakite solvent detergents make it easy for you to remove heavy soils such as drawing and buffing compounds and thick deposits of other oils and greases. Oakite solvent detergents may be used in spray washing machines or in tanks. They offer many advantages: speedy removal of stubborn soils, safety for all metals, economy, reduction of fire hazards, protection against rusting.

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Technical Service Representatives in Principal Cities of U. S. and Canada



Tube Bending Press

This hydraulic, self-contained unit will produce up to 1400 bends an hour without excessive flattening, wrinkling or distortion. It can handle ½ through 2 in. OD steel tubing with a maximum wall thickness of 0.083 in. Clearance is provided to bend a 2-in. tube with a 5-in. centerline radius to 180 degrees.



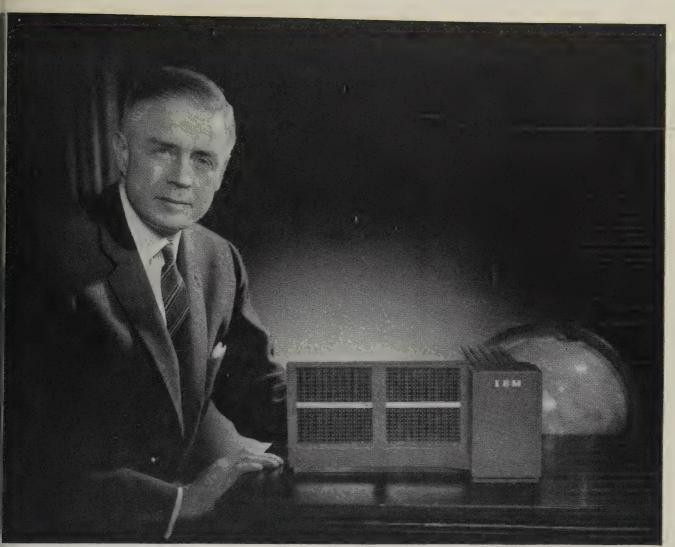
Six new design features are incorporated: 1. One-piece, C-frame casting. 2. Cast steel ram and built-in ram cylinder. 3. Accurate angle-of-bend control. 4. Improved wing die operation. 5. New, manifold-type valves. 6. Adjustable return stroke. Write Pines Engineering Co. Inc., Aurora, Ill. Phone: Aurora 6-7701

Atmosphere Generator

The Exo-Endo produces gas atmospheres between the limits of perfect combustion and modified "302." Requiring only 20 sq ft of floor space, it can be used effectively with all types of furnaces.

At the "302" setting, the gas generated differs from the standard, AGA-type 302 in two respects: 1. Lower dew points—as low as -50° F, with no detectable amounts of methane. 2. About 50 per cent lower hydrogen content.

With adjustment, the generator can produce a nonexplosive atmos-



DMAS J. WATSON, JR.

Portrait by Fabian Bachrach

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have always been proud of the fact that IBM was the of the first companies to put into effect the Payroll wings Plan for the purchase of United States Savings ands, and I am delighted to see this patriotic endeavor nationing year by year and increasing throughout rorganization. Today thousands of IBM employees, rough their participation in the Plan, are helping their untry and providing for the future of their families d themselves." THOMAS J. WATSON, JR., President International Business Machines Corporation

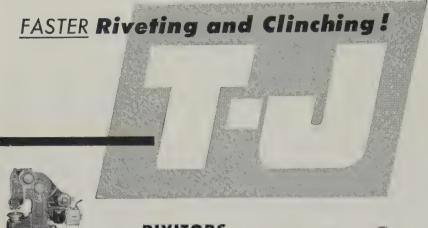
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T-J RIVITOR used for automotive clutch plate assembly. Saves time and labor doing a four-fold job-assembling, setting, inspecting and ejecting.

DOUBLE RIVITOR sets two rivets at a time! Equipped with 10" hoppers, and tooled to automatically feed and set two 1/4" dia. x 5/4" long wagon box head rivets at a time in elevator chain and raddle or elevator flight assemblies for farm implements. Controlled by one foot pedal.



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T-J CLINCHOR ... one of six special 8" throat Underfeed Clinchors used by a large automotive body manufacturer. Feeds and sets 11/16" square cased nuts in outside quarter panels, left and right hand.

DOUBLE CLINCHOR sets two nuts at once! Tooled to feed and set 3/8" x 1/2" x 1/16" thick Fabri-Steel nuts at each operation. Both Clinchors tripped by same foot-operated valve. Adaptable to wide range of clinch nut setting problems.



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T-J meets your needs for labor saving SPEED in assembly . . . with performance-proved Rivitors and Clinchors for many jobs today . . . in aircraft, automotive, farm machinery, stampings of all kinds.

T-J CLINCHORS set clinch nuts 3 to 5 times faster! Fully automatic . . .

reflectively a single foot pedal! Available in Underfeed and Gravity feed models, throat depths 8" to 36".

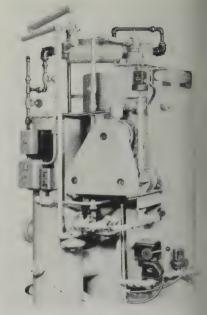
T-J RIVITORS automatically feed and set solid rivets . . . with high production! Electrically powered Rivitor sets 1/16" to ¼" diam. solid steel rivets up to ½" diam. or steel rivets up to ½" diam. or steel rivets up to ½" diam. and up to ¾" long. Throat depths 8" to 36". 1/4" diam. 8" to 36"

Write for Clinchor bulletin 847; Rivitor bulletins 646 and 847. The Tomkins-Johnson Co., Jackson, Mich.





phere for tempering, annealing and stress relief of ferrous alloys, as



well as hardening, annealing and tempering of nonferrous alloys Write Holcroft & Co., 6545 Epworth Blvd., Detroit 10, Mich Phone: Tyler 4-5700

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The ram lock is adjacent to the ram positioner for convenient oper ation. The same handle is used for positioning and locking the ram. The lock, operating on th screw-and-jamnut principle, elimi



nates ram distortion. forces are transmitted directly b the enlarged positioning screw Write Gould & Eberhardt Inc Irvington 11, N. J. Phone: Esse. 3-7300



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STEEL CORPORATION - Pittsburgh

Nondestructive Tester Measures Depths of Cracks



Detecting a crack in iron or steel is not always sufficient; its depth may be just as important. A portable electronic instrument, the Sedac SE-100, does both. It will detect and measure depths of cracks from 0.012 to 0.120 in. deep.

Sedac's most important application will be in salvage work where defects of a certain size are allowable (as in steel mills, certain foundry operations and some forging shops).

Chipping to determine the seriousness of the defect is eliminated Sedac can be used with any inspection method which detects surface cracks. Where the minimum allow able crack depth is known, it can be used for combined measuring and detecting operations.

It can be operated as a complete ly automatic testing unit wher only seams deeper than the prese lected minimum are to be found By attaching appropriate circuits parts can be inspected, rejected or marked automatically.

Operation of the unit depends upon relative motion between the probe and the test piece. The probe contains a sapphire-protected, gimbal-mounted search coil and is on a 10-ft cable. The probe must be kept in physical contact with the part. Direction of scan is at right angles to suspected cracks.

When the probe crosses a crack signal lights flash in the handle and on the face of the instrument A third light remains on until the unit is reset by an inspector.

Comparative crack depth measurements are made by presetting the instrument to desired sensitivity. A test block with cracks of given depths is provided, but any known sample can be used.



In the photo, an operator is using Sedac to check the depth of cracks. This salvage check prevents further (and expensive processing of bars that have deepens in them.

The testing unit weighs 20 lk It operates on 115-volt, 60-cycl supply. Write Magnaflux Corp 7300 Lawrence Ave., Chicago 3: Ill. Phone: Underhill 7-8000



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rSeventeen, 16-gage cutter discs we this dresser about 30 per cent ore width than conventional mods. Outside diameter is 25%-in. Ach cutter has 29 teeth, which is 3%-in. long.

The bearing is of the Neoprenelated type, mounted so the sealed the is exposed. Bearing preload set when dressers are assembled. Dressers can be furnished with facers where a grinding applicator requires opening a wheel farer for more freeness of cutting tion. Holders for the spindle with are available for any type



rinder. Illustrated is the unit ith a universal holder. Write er-O-Matic Tool Co., 5059 W. versey, Chicago 39, Ill. Phone: erkshire 7-6170

oating Thickness Tester

Improvements in design and utily of the Lea Lectromag include:
Calibration with National Butau of Standards thickness sames. 2. Plug attachment at side of ther than top, providing better



visibility of the indicator, sturdier construction and easier manipulation of the tube assembly. 3. Knurled rather than smooth top on the glass tube assembly, providing a better grip for manipulating the glass tube. 4. New compact instrument case with calibration chart for easy calculation.

The instrument has a thickness

testing range from 0.0002 to 0.008 in. Accuracies: ± 15 per cent on thicknesses under 0.001 in. and ± 10 per cent on thicknesses over 0.001 in. The unit operates on 110-115 volts, ac, 60 cycles, with a voltage variation compensating feature. Write Lea Mfg. Co., Waterbury, Conn. Phone: Plaza 3-5116



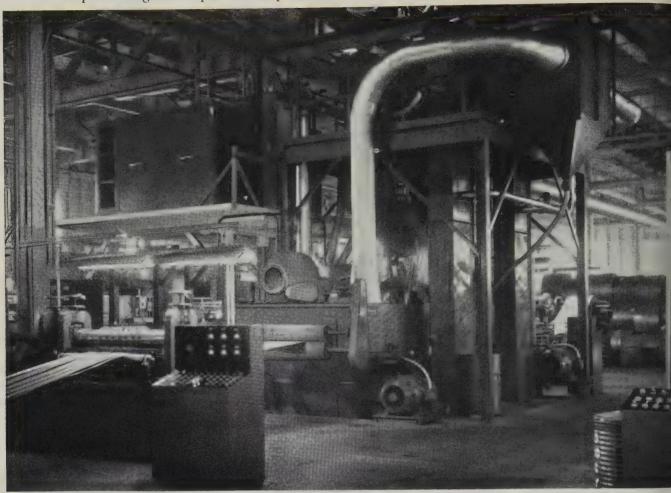
- Capacity 100 Ton
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8 Steps to Low Cost Cleaning of Steel Mill Products

Wheelabrator Mechanical Cleaning SAVES Time and Money—Eliminates Acid Handling and Disposal Problems

If you have any of these finishing problems, Wheelabrator Mechanical Cleaning can save time, money and space and improve your operations:

1. Ingot Mold Conditioning

- 2. Slab and Billet Conditioning
- 3. Continuous Strip Descaling
- 4. Sheet Descaling
- 5. Bar Stock Descaling
- 6. Wire Rod Descaling
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- 8. Etching Mill Rolls

New developments in Airless Wheelabrator blast equipment and abrasives have eliminated all past objections to blast cleaning with an attendant reduction in costs. These have been proved lower than present pickling costs by the many Wheelabrator installations on all types of steel products.

With the Wheelabrator, scale is uniformly and economically removed leaving a surface ideal for cold rolling, cold forming, cold drawing and final finishing such as galvanizing or painting. By eliminating completely or partially the use of acid pickling, the Wheelabrator can equal or better your present costs without

any virgin metal loss and with complete recovery of all scale as well as the abrasives used in its removal. Acid disposal problems are eliminated.

These impressive savings are being effected for steel producers and fabricators alike. Rome Cable Corp., for example, selected Wheelabrating for descaling steel strip because it was the only process that would remove surface scale economically and permit the rest of the plant to maintain its high production without requiring a major portion of its plant area.

Write today for complete information on this modern method of steel finishing for your

problem.



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Mishawaka, Ind.



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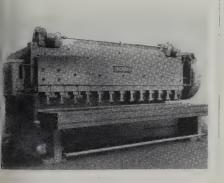
Designed to give better current stribution over their entire area, lese anodes permit faster platg, better chromium coverage and le use of higher current densies.

Of a lead-tin alloy, the anode is truded to provide a dense non-prous structure. Its heavy cross ection enables it to withstand igh current density without overeating or warping. Insulated poks are homogeneously lead urned to the anode to insure posive contact.

Anodes are available in $1\frac{1}{2}$ or in. diameters and in lengths rom 12 to 50 in. Write Hanson-an Winkle-Munning Co., Church t., Matawan, N. J. Phone: Mataran 1-1000

Corrugated Metal Shear

Operating at 20 strokes a minte, this 100-series machine shears orrugated mild steel sheets 12 ft ong. Its table top is recessed o permit proper seating of the tock. Thirteen hydraulic hold-lown plungers are beveled at a 5-degree angle to allow clearance of corrugations when shearing.



Additional features include a light beam shearing gage, two T-slots in the front edge of the table and a slitting adjustment for shearing longer sheets than the shear can accommodate in one operation. Write Cincinnati Shaper Co., Hopple, Garrard & Elam Sts., Cincinnati 25, O. Phone: Kirby 5010



Next time you're watching powered equipment driving through a friction power take-off, check the name plate on the drive back of the engine. In all probability, you'll see a Twin Disc Power Take-Off, putting more horse-power to work. With their simple, rugged design—single-point adjustment—and slippage capacity far in excess of horsepower rating, Twin Disc Power Take-Offs are selected as standard equipment by most of the nation's leading industrial engine manufacturers.

That's why you'll find Twin Disc Power Take-Offs on such leading industrial engines as Ajax - Buda - Caterpillar - Climax - Continental - Cummins-Hercules-International-LeRoi-Minneapolis-Moline - Murphy - Superior - Waukesha - White - Wisconsin... for these manufacturers know they can depend on Twin Disc performance... and they know, too, that wherever their engines may be ultimately working, Twin Disc Service will only be a matter of hours... backed by 60 Parts Stations and 8 Factory Branches or Sales Eng. Offices.



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In a split second, one man can install this tamper-proof, vibration-resistant blind rivet to give you secure fastening in many applications that otherwise would be slow and expensive.

Townsend blind rivets are installed by one man from one side of the work and are used extensively in blind and limited clearance operations. They provide high clinch and a strong fastening method for a wide variety of products.

These rivets are ideal for installation of name plates and serial numbers on appliances and similar units which must retain their original identity permanently. Radio and television components are assembled quickly with Townsend blind rivets. Awnings, jalousies, screens, storm doors and windows are fabricated with ease in the shop or in the field when Townsend blind rivets are used. The illustrations above are but a few representative items where these ingenious rivets are used to keep unit costs down by saving time.

For information, write for Bulletin TL-99 or use the coupon below.



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Write directly to the company for a copy

Small Plant Automation

Typical examples of standard, transfer and special machines equipped with automatic loading and unloading mechanisms are given in "Opportunities Through Automation" —20 pages. Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich.

Welding Equipment

Here is a 1955 catalog of equipment and supplies for gas and electric welding. One section is devoted to industrial safety equipment—catalog H, 84 pages. Burdett Oxygen Co., Dept. K, 3300 Lakeside Ave., Cleveland 14, O.

Leaded Alloy Steel

New Rycut 50 alloy steel is said to cut 25 to 75 per cent faster than conventional 0.50 carbon alloy steel. It has comparable mechanical properties—bulletin 14-6, 4 pages. Joseph T. Ryerson & Son Inc., Box 8000-A, Chicago 80, Ill.

Pneumatic Tools

The complete line of Air Impactools, specifications and equipment furnished with each tool are illustrated in this catalog. On-the-job applications and case histories are given—form 5200-A, 52 pages. Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Die Casting Standards

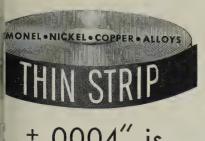
Created to help designers and engineers avoid overspecification, the first five of a series of "Product Standards for Die Castings" are available from job die casters who are members of ADCI. For a list of those nearest you write American Die Casting Institute, 366 Madison Ave., New York 17, N. Y.

Electrical Conduit

Here is a fact-packed, reference data book on the use of rigid steel conduit and electrical metallic tubing —24 pages. Sales Control Center, Pittsburgh Standard Conduit Co., 61 Bridge St., Pittsburgh 23, Pa.

Austenitic Allov

Allegheny Ludlum's A-286 alloy has high strength up to 1300° F. Here is a folder containing corrosion and oxidation resistance data, application and heat-treating information, plus physical and mechanical properties — 4 pages. Advertising Dept., Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22, Pa.



±.0004" is run-of-the-mill



pical of the care that assures absolute formity in all Somers THIN STRIP is s 4-high mill equipped with the est electronic gages and controls. re thickness is constantly checked oughout the run, and maintained thin ±.0004" or less on gages from 10" down. The slightest variation ty be instantly corrected.

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Somers Brass Company specializes rolling nickel and its alloys from 20", and copper and its alloys from 12" both down to .00075".

If you now have, or anticipate, a oblem with exacting standards of strip metal write:



omers Brass Company, Inc.

Plant Layout Models

Here is a 1955-56 price list and a catalog of plant layout equipment. Projects are estimated two ways: Complete jobs are charged on a square-foot basis; currently stocked ¼-in. scale models are individually priced—62 pages. Visual Plant Layouts Inc., Pennsylvania Ave. at River, Oakmont, Pa.

Fire Hood

It protects the head, neck and shoulders against extreme heat. The cape is of aluminized glass cloth, with a neoprene vapor barrier and wool insulation. Hat and side shields are aluminum—bulletin 1301-4. Mine Safety Appliances Co., 210 N. Braddock Ave., Pittsburgh 8, Pa.

Corrosion Prevention

"The Proven Method of Rust Prevention" explains how vapor phase inhibitor papers halt rusting on ferrous metals and aluminum. Packaging requirements and protective life expectancy are given—19 pages. Angier Corp., Framingham, Mass.

Lathes

The series 90, Dyna-Shift is discussed in detail. Information is supplied on its simplicity of operation which is made possible by a new headstock drive—bulletin 1601, 26 pages. Monarch Machine Tool Co., Sidney, O.

Grinding

"A Modern Perspective of the Grinding Process" is offered — 7 pages. Mellon Institute of Industrial Research, University of Pittsburgh, Pittsburgh 13, Pa.

Diesel Power Units

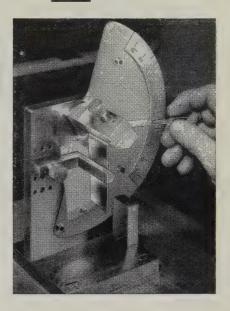
Need a heavy-duty diesel engine? Two types (S and SS) are described. Horsepower ranges from 375 to 1000. Information on the lubrication, cooling and fuel injection systems is included—Form 10,040, 20 pages. Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Gamma Radiography

Here's basic information on how to set up and operate a gamma radiography installation. Selection of the proper radioisotope for handling equipment and the principles of radiation safety are covered. Tables and charts show characteristics, radiographic sensitivity and speed of isotopes—12 pages. Technical Operations Inc., 6 Schouler Court, Arlington, Mass.



no standard is too exacting



Temper requirements for the thin nickel strip (.002") used in sensitive electronic tubes were too exacting to be checked by the usual methods. So Somers carefully hand checks several samples from each lot by the ultra-precise "bend test" illustrated above.

Since 1910 Somers Brass Company has specialized in producing thin strip: nickel and its alloys below .020" and copper and its alloys below .012" with the tensile properties, fatigue resistance, drawing properties and many other requirements which only the most exacting standards of production and quality control can meet.

Whatever your specifications may be, why not take advantage of Somers long experience? Write for field engineer or Confidential Data Blank for a complete survey of your problem at no cost or obligation.



Somers Brass Company, Inc. WATERBURY, CONN.

Why May alloy steels are in your future



Photo courtesy of Bausch & Lomb Optical Co.

DIE LIFE INCREASED 6 TIMES

with

tool steels

the part	STRIKING DIES
the problem	When made from a carbon tool steel with 1% C, striking dies for stamping gold-filled spectacle temples would break after about 15,000 pieces.
the pay-off	The Bausch & Lomb Optical Company increased production to 100,000 pieces by changing to a low-alloy tool steel with about 0.5% C, 1% Si and 0.5% Mo. The difference in cost of the finished dies was negligible but the use of this alloy steel eliminated 85 to 95% of the breakage and also reduced polishing time.



If you make, use, specify or buy steels you need a copy of "ALLOY STEELS PAY OFF"

Such topics as:

Air valve stems on coal washers, anchor chain, annealing retorts, ball cages in universal joints, band saws, bolts, boring cars, bridges, bumpers for passenger cars, cabletool and churn-drill bits, caustic evaporators, central-station feed pumps.

This big, fully documented, 208-page boo gives 60 complete case histories highlighting the many advantages of alloy steel usage such as outlined above. And each case histo is an idea-starter of its own! Get your cop today. Address Dept. 3, on your letterhea please. Climax Molybdenum Company, 50 Fifth Avenue, New York 36, N. Y.



Market

May 16, 1955

Outlook

ON'T BE SURPRISED if steel demand soon uses a little.

Users have been building steel inventories for 1e last two and a half months. This is detected om the American Iron & Steel Institute's report on mill shipments of finished steel in March. hipments that month were 7,268,795 net tons, 1e second highest monthly outturn in history. TEEL calculates March consumption was 6,578,00 net tons, leaving 690,800 tons to go into 1ventory. This is the first time since May, 1953, 1953, 1954, 1955, 1

ng of steel has continued since March. Steel ngot output in April declined only 1.7 per cent rom that of March, while the biggest user—he automobile industry—lowered its production .9 per cent despite some record-breaking output at the end of April.

rurning Point?—During the first two veeks of May, steel ingot production was higher han in March or April: It was at a new record. But auto output in the first week of May eased lown 4 per cent from the preceding week's record rate, and there are the first faint signs of a softening in auto sales.

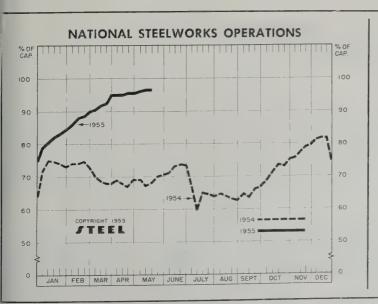
BIGGER YIELDS—There's every reason to beieve mill shipments of finished steel continued n April and up to now at the high rate of March. Mills have built up their stocks in process and can ship a high percentage of their ingot output as finished steel. In March, finished steel shipments were 73 per cent of ingot output. Until then, ingot output had been going up, but finished steel shipments were not rising proportionately. February's mill shipments of finished steel were 72 per cent of ingot output. In January, while the steel industry was building up working stocks of semifinished steel, the ratio of finished steel to ingots was only 68 per cent.

IN LINE—There's nothing alarming about the amount of steel inventories that have been built since Mar. 1. The tonnage is not top heavy. And at our high rate of steel consumption and demand, we need some inventories. But there isn't the inclination to lay in inventories so large as those needed during a shooting war. Also, a possible price rise in steel is no longer an incentive to buy in excess of needs. By the time you can get delivery on orders placed now, the price probably will have gone up, if there is to be an increase.

A GOOD BET—So it's reasonable to believe demand for steel—particularly the light, flat-rolled products—will become a little less intense before long. The steel business could ease and still be high.

No one expects the bottom to fall out of the steel business. There's increasing belief steel demand won't drop so low as was estimated earlier, for business in general has strengthened.

RECORD PACE—Steel ingot production now is probably as high as it will go. For the second consecutive week it was at the new record pace of 2,328,800 net tons. To make this tonnage, mills operated at 96.5 per cent of capacity in the week ended May 15.



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended May 15	l Change	Same 1954	Week 1953
Pittsburgh	99	- 0.5*	71	97.5
Chicago	99.5	+ 0.5	83	106.5
Mid-Atlantic	96.5	0	56	97.5
Youngstown .	98	0	68	105
Wheeling	95.5	0	84	101
Cleveland	101.5	+ 1	78.5	101
Buffalo	104.5	0	67.5	106.5
Birmingham .	93.5	0	56.5	102
New England	88	0	50	93
Cincinnati	89.5	4	59.5	97
St. Louis	106	- 0.5	72.5	92
Detroit	88.5	- 3	64.5	114.5
Western	100	+ 4*	56	110
National Ra	te 96.5	0	68	100.5

INGOT PRODUCTION\$

Week Ended May 15	Week Ago	Month Ago	Year Ago
INDEX 145.3† (1947-1949=100)	145.1	142.2	105.2
NET TONS 2,334† (In thousands)	2,331	2,284	1.690

*Change from preceding week's revised rate. †Estimated, †Amer, Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	May 10	May 3	Month	Apr.
	1955	1955	Ago	Average
(1947-1949-100)	 144.8	144.8	144.8	144.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended May 10

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1 Rails, Light, 40 lb Tie Plates	\$4.525 5.917 5.275	Sheets, Electrical Strip, C.R., Carbon Strip, C.R., Stainless, 430	\$9.350 7.493
Axles, Railway	7.500	(lb)	0.415
Wheels, Freight Car. 33		Strip, H.R., Carbon	5.075
in (per wheel)	48.500	Pipe, Black, Buttweld (100 ft)	15.000
Plates, Carbon Structural Shapes	4.675 4.517	Pipe, Galv., Buttweld (100	201000
Bars, Tool Steel, Carbon	4.011	ft)	18.605
(lb)	0.430	Pipe, Line (100 ft)	146.804
Bars, Tool Steel, Alloy, Oil	0.100	Casing, Oil Well, Carbon (100 ft)	154.216
Hardening Die (lb)	0.525	Casing, Oil Well, Alloy	101.210
Bars, Tool Steel, H.R.,		(100 ft)	
Alloy, High Speed W		Tubes, Boiler (100 ft)	1
6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115	Tubing, Mechanical, Car-	İ
	1.110	Tubing, Mechanical, Stain-	*
Bars, Tool Steel, H.R.,		less, 304 (100 ft) 1	167.023*
Alloy, High Speed W 18, Or 4, V 1 (lb)	1.610	Tin Plate, Hot-dipped, 1.25	0 500
Bars, H.R., Alloy	8.875	Tin Plate, Electrolytic,	8.533
Bars, H.R., Stainless, 303	0.402	0.25 lb	7.233
(ib)	0.423	Black Plate, Canmaking	
Bars, H.R., Carbon	5.000	Quality	6.333
Bars, C.F., Carbon	4.963 8.160	Wire, Drawn, Carbon Wire, Drawn, Stainless,	8.075
Bars, C.F., Carbon	11.375	430 (lb)	0.545
Bars, C.F., Stainless, 302	221010	Bale Ties (bundle)	5.860
(lb)	0.438	Nails, Wire, 8d Common.	7.815
Sheets, H.R., Carbon	°4.870	Wire, Barbed (80-rod spool) Woven Wire Fence (20-rod	7.127
Sheets, C.R., Carbon	5.864	roll)	16.925
Sheets, Galvanized	7.220		
Sheets, CR., Stainless, 302 (lb)	0.553	‡Not available. *Not able with previous figure.	compar-
	0.000	able with previous ngure.	

STEEL'S FINISHED STEEL PRICE INDEX*

			May 11 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index	(1935-39	avg. =100)	194.53	194.53	194.53	189.74	156.13
Index	in cents	per lb	5.270	5.270	5.270	5.140	4.230

STEEL'S ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT* No. 2 Fdry, Pig Iron, GT Basic Pig Iron, GT Malleable Pig Iron, GT	56.54 56.04 57.27	\$118.45 56.54 56.04 57.27	\$118.45 56.54 56.04 57.27	\$113.70 56.54 56.04 57.27	\$93.23 46.47 45.97 47.27
Steelmaking Scrap, GT		35.33	57.27 37.41	57.27 27.67	47.27 31.67

*For explanation of weighted index see Steel, Sept. 19, 1949, p. 54; of arithmetical price composite, Steel, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point,

11.50 2000 2					
FINISHED STEEL	May 11 1955	Week Ago	Month Ago	Year Ago	ő Yr Age
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.43
Bars, H.R., Chicago	4.30	4.30	4.30 4.55	4.15 4.405	3.4
Bars, H.R., deld. Philadelphia Bars, C.F., Pittsburgh	4.55 5.40	4.55 5.40	5.40		3.93 4.10-4.1
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.40
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.4
Shapes, deld Philadelphia Plates, Pittsburgh	4.53 4.225	4.53 4.225	4.53 4.225	4.38 4.10	3.4 3.1
Plates, Chicago	4.225	4.225	4.225	4.10	3.5
Plates, Coatesville, Pa	4.225	4.225	4.225	4.10	3. 6.
Plates, Sparrows Point, Md Plates, Claymont, Del	4.225 4.225	4.225 4.225	4.225	4.10 4.10	3.4
Sheets, H. Pittsburgh	4.05	4.05	4.05	3.925	3.:
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.
Sheets, C.R., Pittsburgh	4.95 4.95	4.95 4.95	4.95 4.95	4.775	4.1
Sheets, C.R, Chicago Sheets, C.R, Detroit	5.10	5 10	5.10	4.975	4.,,
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.1
Strip, H.R., Pittsburgh	4.05	4.05 4.05	4.05 4.05	4.425 3.925	3.2
Strip, H.R., Chicago Strip, C.R., Pittsburgh	4.05 5.75	5.75	5.75	5.45	4
Strip, C R., Chicago	5.85	5.85	5.85	5.70	4.3
Strip, C.R., Detroit	5.90	5.90 K 75	5.90 5.75	5.65 5.525	4.35
Wire, Basic, Pittsburgh Nails, Wire, Pittsburgh	5.75 6.85	5.75 6.85	6.85	6.55	4.5 5.3
Tin Plate (1.50 lb), box, Pitts.		\$9.05	\$9.05	\$8.95	\$7.5
SEMIFINISHED STEEL					
Billets, Forging, Pitts. (NT)	\$78.00	\$78.00			\$63.
Wire Rods, 7-%" Pitts		4.675	4.675	4.525	3.8
PIG IRON, Gross Ton				- THE	
	56.00	\$57.00 56.00	\$57.00 56.00	\$57.00 56.00	\$47.00 46.00
Basic, Vailey	59.66	59.66	59.66	59.66	49.4
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.5
No. 2 Fdry, Chicago	56.50	56.50	56.50 56.50	56.50 56.50	46.5
No. 2 Fdry Valley No. 2 Fdry, deld. Phila	56.50 55.16	56.50 55.16	55.16	60.16	49.9
No. 2 Fdry, Birm	52.88	52 .88	52.88	52.88	42.3
No. 2 Fdry (Birm.) deld. Cln.	60.58	60.58	60.58	60.43 56.50	49.0- 45.5
Malleable, Valley	56.50 56.50	56.50 56.50	56.50 56.50	56.50	46.5
Ferromanganese, Duquesne. 1		190.00†	190.00†	200.00t	175.6

•75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP. Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts \$34.50	\$35.50	\$38.50	\$29.50	\$36.
No. 1 Heavy Melt, E. Pa 36.00	36.50	37.75	23.00	28.
No. 1 Heavy Melt, Chicago 34.00	34.00	36.00	30.50	30.
No. 1 Heavy Melt, Valley 34.50	34.50	37.50	29.50	35.
No. 1 Heavy Melt, Cleve,31.50	31.50	35.00	28.50	31.
No. 1 Heavy Melt. Buffalo. 30,50	30.50	32.50	25.50	29.
Rails, Rerolling, Chicago 52.50	52.50	52.50	42.00	48.
No. 1 Cast, Chicago 40.50	40.50	41.50	38.50	42.
COKE, Net Ton				

COKE, Net T	on				
Beehive, Furn, Beehive, Fdry, Coven, Fdry, Ch		16.75	\$13.75 16.75 24.50	\$14.75 16.75 24.50	\$14 16 21

Daily Nonferrous Price Record

1	Price May 11	Last Chang		1	Previous Price	Apr. Avg.	Mar. Avg.	May 1954 Avg.
Copper	36.00	Mar.	29,	1955	33.00	36.000	33.222	30.000
Lead	14.80	Oct.	4,	1954	14.55	14.800	14.800	13.800
Zinc	12.00	Apr.	6,	1955	11.50	11.927	11.500	10.290
Tin	91.375	May	11,	1955	91.125	91.458	87.194	93.600
Nickel	64.50	Nov.	24,	1954	60.00	64.500	64.500	60.000
Aluminum	23.20	Jan,	12,	1955	22.20	23.200	23.200	21.500
Magnesium	28.50	Mar.	21,	1955	27.00	28.500	27.556	27.000

Quotations in cents per pound based of COPPER, deld. Conn. Valley; LEAD, comon grade, deld. St. Louis; ZIN prime western, E. St. Louis; ZIN Straits, deld. New York; NICKEL, el trolytic cathodes, 99.9%, base size refinery, unpacked; ALUMINUM, prime ingots, 99+%, deld.; MAGNESIU 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

• A source of price information.

Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.

A directory of producing points.

Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.

- A source of price data for making your own comparisons.
 Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- A source of information on market trends.
 Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- Reports on iron and steel production, and materials and product shipments.



Etna Universal Drive

You'll notice a trend toward Etna's modern machine design. Etna has sold more Universal Drive Mills than all other manufacturers combined. The Universal Drive provides greater accuracy in the forming of the tube, and allows an easier change from the manufacture of one diameter tube to another.

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For greater efficiency an Oil Cooled Transformer is incorporated into the machine. It is a permanent unit and never has to be replaced. Cooling with oil eliminates the necessity to dry out the transformer after each days work, which is necessary when water is used as a transformer coolant. Etna Mills . . . Built for continuous operation. Write for complete details.

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Nonferrous Metals

Events in early May could be the forerunner of an easier tone in the copper industry by third quarter. But labor conditions in motordom and copper itself could upset things

Nonferrous Metal Prices, Pages 152 & 153

IF THE COPPER INDUSTRY doesn't settle down by the end of the third quarter, it won't be the fault of events in the first ten days of May. Here is what happened, all in favor of a more stable market:

The industry won a victory in Congress when the House of Representatives voted for a three-year extension of the suspension of import taxes on copper. Previous extensions had been for two years at the most. The Senate was expected to give its approval to the extension late last week. Other things being favorable, this action should assure domestic producers of increased imports over the next three years.

Better Deal, Amigos—Chile relaxed its tax and exchange regulations on foreign producers of copper. This will enable Anaconda Copper Mining Co. and Kennecott Copper Corp. to operate their facilities there more profitably. As a result, both companies have pledged themselves to expansions costing each about \$2 million. This, too, should help increase imports of copper from Chile.

The Rhodesian Selective Trust group announced it will sell its copper for 35 cents a pound for the next 30 days. This is lower than had been anticipated, falling 1 cent under the domestic price. Inasmuch as this group supplies only about one-third of Great Britain's copper, there has been much speculation as to the effects of the announcement on the fluctuating London Metal Exchange. At presstime, that price was holding at an equivalent of 38 cents a pound, cash.

Natural Question—It is only natural that these events should start talk concerning a reduction in the domestic price of 36 cents. That level resulted from the pressure of an overpriced London market and the subsequent diversion of foreign metal from the U. S. Now that this pressure has subsided, it would not be surprising to see the domestic price of copper come down from its unnatural perch. But at presstime, there was no indication that this would happen in the near future.

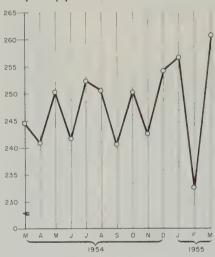
The supply situation is unchanged. Whether it eases in the third quarter depends on the automotive industry and labor conditions at the time. If there is no strike in motordom, de-

mand will be sustained right through the year, but not at current high levels. If there is a strike, a little more metal will be available to other users.

If It Isn't One Thing—Copper producers have to worry about their

Aluminum Hits New Peak

(primary production in millions of lb)



Source: Aluminum Association

own labor problems, too. Contracts come up for renewal in midsummer, and some observers think the producers are going to have trouble explaining to labor's satisfaction the differential between last year's 30-cent price and the present price. It may mean substantial pay-increase demands, and it could end up in a strike in the copper mines.

More Scrap for West Germany

The Bureau of Foreign Commerce has relaxed its copper scrap quotas for West Germany and has issued a supplemental copper alloy scrap quota (copper content, 3000 net tons) for the second quarter. West Germany was faced with unusual hardship after the U.S. restricted scrap exports in the first quarter. That country was almost solely dependent on American sources for this material and had been the largest importer of U.S. copper scrap. The supplemental quota is in addition to the second-quarter allotment (copper content, 7000 tons) for export to all countries except Canada. Export licenses for the supplemental amount will be issued on a historical basis.

Zinc Use Up, Stocks Down

One of the most favorable reports ever to come from the zinc industry confirms the feeling that was pre valent at last month's annual meet ing of the American Zinc Institute Business has rarely been better.

Shipments of slab zinc to domestiusers reached a ten-year high in Apri -89.441 tons. This brisk civilian bus iness was largely responsible for the reduction of stocks to 74,745 tons at the end of the month, lowest level since June, 1952. It was also responsible for shipments of only 8488 tons to government stockpile, the lowest figure since the government began its current program of buying last July. Production was off from March, but at 83,804 tons it was still better than in any month in 1954, except December. Unfilled orders of 65,127 tons, highest since February, 1952, indicate that business will remain strong for some time.

Stocks of special high grade still declined, and at 6559 tons it is evident there is not enough to go around. Almost as impressive is the *ceductio.* of prime western stocks to 54,230 tons, down 7384 tons from the end of March.

Primary Aluminum Sets Record

Aluminum continued its climb to new heights in March after faltering temporarily in the short month of February. According to the Aluminum Association (see chart), primary production for March was 260,543,479 lb, setting a record that is destined for short life. Every category of products in the report showed considerable gains over February. Earlier this month, Douglas Watson, Mc-Kinsey & Co., San Francisco, told the Light Metals Utilization & Fabrication Conference at Washington State College that by 1960 he expects consumption to reach 2,250,000 tons annually.

Proof of Nickel Shortage

Rumors of premium-price deals for nickel are becoming frequent. The highest heard so far is the offer of one large automaker to pay 94 cents a pound for 100 tons. Market price is 64.50. Even at this premium, the buyer got only about half the amount asked for.



Stainless steel sheathing will soon cover 42 stories containing 1,300,000 square feet of office space in New York's newest skyscraper—the Socony Vacuum Building—by Spring of 1956.

Is stainless steel coming your way, too? It's strong . . . light . . . corrosion resistant. It serves both as a structural and decorative material. And a little goes a long, long way.

Contact your supplier for full particulars.

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DOWN-DOWN to new diving depths are modern submarines with hull plates and structural members made of high-strength alloy steels to hold back tons of sea water.



STRAIGHT AHEAD and plenty fast are modern trains where diesels and passenger cars depend on alloy steels for critical operating parts, stainless for longer lasting bodies.

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 23.20, pigs 21.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Sl, 25.00; No. 43, 5% Sl, 24 %0: No. 142, 4% Cn, 1.5% Mg, 2% Nl, 26.50; No. 195, 4.5% Cu, 0.8% Sl, 25.90; No. 214, 3.8% Mg, 26.40; No. 356, 7% Sl, 0.3% Mg, 24.90.

Sa, 0.3% lig, 24.30.

Antimony: R.M.M. brand, 99.5%, 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryilium: 97%, lump or beads, \$71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Recording Park Beryllium Aluminum: 5% Be, \$72.75 per lb of contained Be, f.o.b, Reading, Pa., Elmore, O. Beryllium Copper: 3.75-4.25% Be, \$40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O. Bismuth: \$2.25 per lb, ton lots.

Cadmium: Sticks and bars, \$1.70 per lb, deld. Cobalt: 97-99%, \$2.60 per lb for 550-lb keg; \$2.62 per lb for 100-lb case; \$2.67 per lb under 100 lb.

Columbium: Powder, \$119.20 per lb, nom.

Copper: Electrolytic 36.00 deld, Conn. Valley; 36.00 deld, Midwest; Lake 36.00 deld; Fire refined 35.75 deld.

Germanium: 99.9%, \$295 per lb, nom.

Gold: U. S. Treasury, \$35 per oz.

Indium: 99.9%, \$2.25 per troy oz.

Indium: 99.9%, \$2.25 per troy oz.

Iridium: \$90.\$120 nom. per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, st. Louis; N. Y. basis, add 0.20.

Lithium: 99 + %, \$13.\$18, f.o.b. Minneapolis, depending on quantity and form. For rod, add \$2 a lb; for wire, add \$3 a lb.

Magnesium: 99.8%, self-palletizing pig 28.50; notched ingot 29.25, 10,000 ib or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for lugot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.50 for both pig and ingot. Sticks 1.3 in. diameter, 49.00, 100 to 4999 lb, f.o.b Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 34.00; alloy M 36.00, 10.000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50

Mercury: Open market, spot, New York, \$310-\$312 per 76-lb flask,

Molybdenum: Powder 99% hydrogen reduced

Mercury: Open market, spot, New York, \$310-\$312 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced \$3-\$3.25 per lb; pressed ingot \$4.06 per lb; sintered ingot \$5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: \$120-\$130, nom., per troy oz.

Paliadium: \$17-\$20 per troy oz.

Palianum: \$16-\$21.50 per mg radium content, depending on quantity.

Rhodium: \$18-\$125 per troy oz.

Sclenium: \$45-\$56 per troy oz.

Sclenium: \$95-\$6, \$6-\$7.25 per lb.

Selenium: 99.5%, \$6-\$7.25 per lb. Silver: Open market, 87.00 per troy oz. Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod \$68.70 per lb; powder \$56.63 per lb.
Tellurium: \$1.75 per lb.

Thallium: \$1.75 per lb.
Thallium: \$12.50 per lb.
Tin: Straits, N. Y., spot and prompt, 91.375.
Titanium: Sponge, 99.3 + %, grade A-1 ductile
(0.3% Fe max) \$3.95, grade A-2 (0.5% Fe
max) \$3.50 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots \$4.35-\$4.40 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99 + % hydrogen reduced, \$4.65. Treated ingots, \$6.70.

\$6.70,
Zine: Prime Western, 12.00; brass special,
12.25; intermediate, 12.50, E. St. Louis, freight
allowed over 0.50 per pound. High grade,
13.35; special high grade, 13.50. Diecasting
alloy ingot No. 3 16.00: Nos. 2 and 5, 16.50.
Zirconium: Ingots, commercial grade, \$14.40
per lb; low-hafnium reactor grade, \$23.70.
Sponge, \$7.50 per lb. Powder, electronics
grade, \$15 per lb; flash grade, \$11.50.
(Note: Chromium, mananese and silicon
metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy, 27.50-29.00; No. 12 foundry alloy (No. 2 grade), 27.00-28.00; 5% sflicon alloy, 0.60 Cu max, 29.25-29.75; 13 alloy, 0.60 Cu max, 28.75-29.50; 195 alloy, 28.50-29.75; 108 alloy, 27.50-28.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 27.75-28.50; grade 2, 27.75-28.00; grade 3, 26.25-27.75; grade 4, 25.00-26.75 26.75

Brass Ingot: Red brass No. 115, 35.50; tin bronze No. 225, 47.50; No. 245, 40.75; high-leaded tin bronze No. 305, 39.00, No. 1 yellow, No. 405, 30.75; manganese bronze No. 421,

Magnesium Alloy Ingot: AZ63A, 31.0 26.00; AZ91B, 31.00; AZ92A, 31.00. 31.00; AZ91B,

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, \$1.74; rod, bar, wire, \$1.71.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 41.35-42.45; 30,000-lb lots, 41.48-42.58; l.c.l., 41.98-43.08. Weatherproof, 100,000 lb, 40.78-41.60; 30,000 lb, 41.03-41.85; l.c.l., 41.53-42.35. Magnet wire deld., 15,000 lb or more, 48.15-49.31; l.c.l., 48.90-50.06.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more \$20 per cwt; pipe, full colls \$20 per cwt; traps and bends, list prices plus 30%.

TITANIEM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, \$15; sheared mill plate, \$12; strip, \$15; wire, \$10; forging billets, \$9; hot-rolled and forged bars, \$9.

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 19.50-20.50; plates, 18.50-

ZIRCONIUM

Plate \$27; H.R. strip \$28; C.R. strip \$35; forged or H.R. bars \$27; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

A	Nickel	Monel	Inconel
Sheet, C.R	102	78	99
Strip, C.R	102	87	125
Plate, H.R	97	82	95
Rod, Shapes H.R	87	69	93
Rod, Shapes C.R		75	115
Seamless Tubes		108	153
Shot, Blocks		65	

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or	Rot	ınd	Hexago	onal
across flats	2011-T3	2017-T4	2011-T3 2	017-T4
Drawn				
0.125	63.5	62.0		
0.156-0.172	53.9	52.3		
0.188	53.9	52.3		66.8
0.219-0.234	51.1	49.5		
0.250 - 0.281	51.1	49.5		63.7
0.313	51.1	49.5		60.8
Cold-finished				
0.375-0.547	49.9	47.5	59.8	57.2
0.563-0.688	49.9	47.5	56.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3		48.9
1.125-1.500	46.9	44.6	50.4	48.9
Rolled				
1.563	45.7	43.4		
1.625-2.000	45.1	42.8	• • • •	47.2
2.125-2.500	44.0	41.7		21,2
2.563-3.375	42.7	40.5		

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finisi (30,000 lb base; freight allowed over 499 lb

Thickness Range Inches	Flat Sheet	Flat Sheet Circles	Coiled Sheet	Coiled Sheet Circle
0.249-0.136 0.135-0.096	35.9 36.4	40.4 41.3	***	
0.095-0.077 0.076-0.061 0.060-0.048	37.1 37.7 38.2	42.3 43.2 43.6	34.6 34.8 35.1	39. 39. 40.
0.047-0.038 0.037-0.030 0.029-0.024	38.7 39.1 39.7	44.5 45.0 45.5	35.6 36.0 36.3	40. 41 41
0.023-0.019 0.018-0.017	40.4 41.2	46.9	37.1 37.7 38.5	44.
0.016-0.015 0.014 0.013-0.012	42.1 43.1 44.3	• • •	39.5 40.2	4.
0.011 0.010-0.0095 0.009-0.0085	45.3 46.5 47.8	• • •	41.4 42.5 44.0	4 5 ×
0.008-0.00 75 0.00 7 0.00 6	49.4 50.9 52.5	• • •	45.2 46.7 48.1	5 · 61,
	diam.	†26 in. max	diam.	

ALUMINUM

Plates and Circles: Thickness 0.250-3 in 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Ba.
1100-F, 3003-F		38.8 39.9
5050-F	. 36.7	41.6
5052-F		43.4 44.0
2024-T4*		47.9 56.2
*24-48 in. widths o		

ALUMINUM

Forging Stock: Round, Class 1, 47.80-27.3 in specific lengths 36-144 in., diameters 0.27 8 in. Rectangles and squares, Class 1, 53.6 41.00 in random lengths, 0.375-4 in. thic widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20 lengths, plain ends, 90,000-lb base, per 100

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
3/4	\$16.10	2	\$ 49.
1	25.35	4	136.
1 1/4	34.30	6	244.
1 1/2	41.00	8	368.

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 97.4 0.064-in, 76.00, 0.125-in. 61.50, 30,000 lb as over, f.o.b. mill.

Plate: Hot-rolled AZ31, 59.00, 30.000 lb more, 0.250 in. and over, widths to 48 lengths to 144 in.; raised pattern floor pla 62.00, 30.000 lb or more, ¼-in. thick, wid 24-72 in., lengths 60-192 in.

Taxin, lengths of 182 ll.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 ± 72.20; 1 x 4 in., 67.00, Rod, 1 in., 59.; 2 in., 66.50. Tubing, 1 in. OD x 0.065 ± 90.00. Angles, 1 x 1 x ½-in., 75.90; 2 x 2 ½-in., 70.00. Channels, 5 in., 70.90. I-beam 5 in., 70.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 17.00-18.50; sheet, 13.50-16.00; borings and turnings, 9.10.00; crankcases, 13.50-16.00; industrial calings, 13.50-18.00.

BRASS MILL PRICES

		MITT DO	- TTO-		CODAT	ALLOWA	NORS f
		MILL PRO	DUCTS 8	L .	SULAL	ALLOWA	TACED -
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clear
Copper	54.76b	52,36c		54.82	32.000	32.000	31.2
Yellow Brass	46.27	46.21d	46.81	49.18	23.875	26.625	22 0
Red Brass, 85%	50.99	50.93	51.53	53.80	28.125	27.875	27.3
Low Brass, 80%	49.75	49.69	50.29	52.56	27.000	26.750	26.7
Naval Brass	49.99	44.30	57.05	53.15	22.125	21.875	21.3
Com. Bronze, 90%	52.78	52.72	53.32	55.34	29.250	29.000	28.5
Nickel Silver, 10%	60.20	62.53g	62.53		27.625	27.375	12.8
Phos. Bronze, A, 5%	73.03	73.53	73.53	74.71	32.250	32.000	31.0
Silicon Bronze	5 8.8 2	58.01	58.86	60.80e	31.125	30.875	30.1
Manganese Bronze		47.83	58.24		22.125	21.875	21.8
Muntz Metal	48.14	43.95			22.375	22.125	21.6

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawd. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipp point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Lead

r and Brass: No. 1 heavy copper and 29.50-30.50; No. 2 copper, 28.00-29.00; popper, 26.00-27.00; No. 1 composition turnings, 24.50; yellow brass turnings, 15.00; new clippings, 21.00-22.00; No. 1 brass rod clippings, 21.00-22.00; No. 1 brass rod 19.00-21.00; auto radiators, unsweated, 19.00-21.00; auto radiators, unsweated, 19.00-20.50; heavy, 11.50-11.75; battery plate, 6.00-11.00; auto radiators, 20.00-20.50; pipe, 19.00-20.50; heavy, 11.50-11.75; battery plate, 6.00-11.00; pipe, 19.00-20.50; mixed babbitt, 12.00-14.00; pipe, 19.00-19.00; iron castings, not over 10% able Fe, less full deduction for Fe, 16.00-10.00; pipe, 19.00-10.00; pipe, 1

: Clippings 28.00-34.00; old sheet 26.00-turnings 21.00; rods 28.00-34.00. l: Sheets and clips 57.00-70.00; rolled 57.00-70.00; turnings 40.00-55.00; rod 57.00-70.00 & I:

No. 1 pewter 50.00-59.00; block tin pipe 77.00; No. 1 babbitt 45.00-48.00, Old zinc 4.50-5.00; new die cast scrap .00; old die cast scrap 3.25-3.50.

REFINERS' BUYING PRICES

REFINERS' BUYING PRICES
s per pound, carlots, delivered refinery)
enum: 1100 clippings, 18.50-20.00; 3003
ngs, 18.50-20.00; 6151 clippings, 18.505052 clippings, 18.50-20.00; 2014 clip18.00-19.50; 2017 clippings, 18.00-19.50;
clippings, 18.00-19.50; mixed clippings,
19.00; old sheet, 16.50-17.50; old cast,
17.50; clean old cable (free of steel),
19.50; borings and turnings, 17.00-18.00.
10m Copper: Heavy scrap, 0.020-in, and
er, not less than 1.5% Be, 48.00; light
43.00.

7. Brass; No. 1 copper, 32.50-33.00; No.

r, Brass: No. 1 copper, 32.50-33.00; No. per, 31.00-31.50; light copper, 29.25-29.75; ry brass (60% copper) per dry copper

nt, 29.50.

INGOTMAKERS' BUYING PRICES

Cents per pound, carlots, delivered)
Pr. Brass: No. 1 copper, 32.00-33.00; No.
per, 30.50-31.50; light copper, 28.75-29.75;
1 composition borings, 26.50-27.50; No. 1
osition solids, 27.00-28.00; heavy yellow
solids, 20.00-21.00; yellow brass turn19.50-20.50; radiators, 20.50-22.00.

PLATING MATERIAL

shipping point, freight allowed on

ANODES
nium: Special or patented shapes \$1.70

b.
er: Flat-rolled 51.42 oval 50.92, 50000 lb; electrodeposited 49.40, 2000-5000 lb
cast 50.54, 5000-10,000 lb quantities.
el: Depolarized, less than 100 lb \$1.015;
199 lb 99.50; 500-4999 lb 95.50; 5000-29,999
.50; 30,000 lb 91.50. Carbonized, deduct 3
a lb, All prices eastern delivery effective

h, 1955.

Bar or slab. less than 200 lb, \$1.095; 200-lb, \$1.08; 500-999 lb, \$1.075; 1000 lb or lb, \$1.08; 500-999 hs, \$1.07. \$1.07. Bar 20.00, bar or flat top 19.00, ton

CHEMICALS

mium Oxide: \$2.15 per lb, in 100-lb drums.

mic Acid: Less than 10,000 lb 28.50; over

10 lb 27.50.

omic Acid: Less than 10,000 lb 28.50; over 00 lb 27.50.

ser Cyanide: 100 lb 76.80; 200 lb 76.05; ler Cyanide: 100 lb 75.05; 1000 lb and 75.80; 400-900 lb 75.05; 1000 lb and 73.05; effective Mar. 24, 1955.

ser Sulphate: Crystal, 100 lb 21.50; 200 lb 90; 300 lb 17.50; 400 lb 17.00; 500-1990 lb 0; 2000-10,000 lb 15.25; 10,000 lb and up 5. Powder, add 0.5 to above prices. Effect Mar. 29, 1955.

sel Chloride: 100 lb 46.50; 200 lb 44.50; lb 43.50; 400-4900 lb 41.50; 5000-9900 lb 0; 10.000 lb and over 38.50. All prices ern delivery, effective Jan. 1, 1955.

tel Sulphate: 100 lb 38.25; 200 lb 36.25; lb 35.25; 400-4900 lb 33.25; 5000-35.900 lb 35.25; 400-4900 lb 33.25; 5000-35.900 lb 35.25; 16.000 lb 30.25. All prices eastern very, effective Jan. 1, 1955.

ser Cyanide: (Cents per ounce) 4-oz bottle, 75; 100-oz bottle, 79.375; f.o.b. St. Louis, York and Los Angeles. Effective Apr. 6, 100 lb 10.50 l

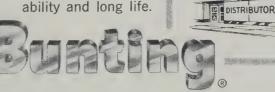
Cyanide: Under 1000 lb 54.30; 1000 lb



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BRONZE BEARINGS . BUSHINGS . PRECISION BRONZE BARS THE BUNTING BRASS AND BRONZE COMPANY TOLEDO 1, OHIO BRANCHES IN PRINCIPAL CITIES

				THE STATE OF THE S
SEMIFINISHED	LosAngeles B35.475 Minnequa, Colo. C104.925	PLATES	BARS	Pittsburgh J54,3 Portland, Oreg. O45,0 SanFrancisco S74,7
INGOTS, Carbon, Forging (NT)	Monessen, Pa. P74.675 No. Tonawanda, N. Y. B11 4.675	PLATES, Carbon Steel	BAR, Hot-Rolled Carbon Ala.City, Ala. R24.30	
Munhall, Pa. U5\$61.50	Pittsburg, Calif. C115.325 Portsmouth P124.675	Ala.City, Ala. R24.225 Aliquippa, Pa. J54.225	Aliquippa, Pa. J54.30 Alton, Ill. L14.50	Clairton, Pa. U55.2
Detroit R7\$65.00	Roebling, N.J. R54.775 So. Chicago, Ill. R24.675	Ashland Ky. (15) A104.225	Atlanta A11	Gary, Ind. U55.2 Houston S55.4
Houston S5	SparrowsPoint, Md. B24.775	Bessemer, Ala. T24.225 Bridgeport, Conn. N194.475	Bessemer, Ala. T24.30 Birmingham C154.30	KansasCity, Mo. S5 5.4 Youngstown U5 5.2
Munhall, Pa. U565.00	Sterling, Ill. (1) N154.675 Sterling, Ill. N154.775	Buffalo R2 4.225 Clairton, Pa, U5 4.225	Bridgeport, Conn. N194.55 Buffalo R24.30	
BILLETS, BLOOMS & SLABS	Struthers, O. Y14.675 Torrance, Calif. C115.475	Claymont, Del. C224.225 Cleveland J5, R24.225	Canton, O. R2 4.40 Clairton, Pa. U5	Amhridge Pa W18 5.
Carbon, Rerolling (NT) Aliquippa, Pa, J5\$64.00	Worcester, Mass. A74.975	Coatesville, Pa. L74.225 Conshohocken, Pa. A34.225	Cleveland R24.30 Ecorse, Mich. G54.40	Buffalo B55.
Bessemer, Pa. U564.00 Bridgeport, Conn. N1969.00		Ecorse, Mich. G54.325	Emeryville, Calif. J7 5.05	Carnegie, Pa. C125
Buffalo R264.00	STRUCTURALS	Fairfield, Ala. T24.225 Fontana, Calif. (30) K14.875	Fairfield, Ala. T24.30 FairlessHills, Pa. U54.45	Cleveland A7 C20 . 5
Clairton, Pa. U564.00 Ensley, Ala. T264.00	Carbon Steel Stand. Shapes	Gary, Ind. U5	Fontana, Calif. K15.00 Gary, Ind. U54.30	Detroit R5 P17
Fairfield, Ala. T264.00 Fontana, Calif. K172.00	Ala.City,Ala. R24.25	GraniteCity, Ill. G44.425 Harrisburg, Pa. C54.225	Houston S54.55 Ind.Harbor,Ind. I-2, Y1.4.30	
Gary, Ind. U5	Aliquippa, Pa. J54.25 Bessemer, Ala. T24.25	Houston S54.275 Ind. Harbor, Ind. I-2, Y1.4.225	Johnstown.Pa. B24.30 Joliet,Ill. P224.30	FranklinPark Ill. N5 54
Lackawanna, N.Y. B2 64.00 LoneStar, Tex. L6 70.00	Bethlehem, Pa. B24.30 Birmingham C154.25	Johnstown, Pa. B24.225 Lackawanna, N.Y. B24.225	KansasCity, Mo. S54.55 Lackawanna, N.Y. B24.30	GreenBay, Wis. F75.
Munhall, Pa. U564.00 Pittsburgh J564.00	Clairton, Pa. U5 4.25 Fairfield, Ala. T2 4.25	LoneStar, Tex. L64.55 Mansfield, O, E64.225	LosAngeles B3 5.00 Massillon, O. R2 4.40	Hammond, Ind. L2, M13.5.4 Hartford, Conn. R25.9
So.Chicago, Ill. R2, U564.00 So.Duquesne, Pa. U564.00	Fontana, Calif. K14.90	Minnequa, Colo. C105.075	Midland.Pa. C184.30	Harvey, Ill. B55.4 Los Angeles R2, S306.8
Youngstown R264.00	Gary, Ind. U5	Munhall, Pa. U54.225 Newport, Ky. N94.225	Milton, Pa. M184.30 Minnequa, Colo. C104.75	Mansfield, Mass. B55.9 Massillon, O. R2, R85.4
Carbon, Forging (NT)	Houston S54.30 Ind. Harbor, Ind. I-24.25	Pittsburgh J54.225 Riverdale, Ill. A14.225	Niles, Calif. P15.00 N. Tonawanda, N.Y. B114.30	Midland, Pa. C185.4
Aliquippa, Pa. J5\$78.00 Bessemer, Pa. U578.00	Johnstown, Pa. B24.30 Kansas City, Mo. S54.30	Seattle B35.125 Sharon, Pa. S34.225	Pittsburg, Calif. C115.00 Pittsburgh J54.30	Newark, N.J. W18 5.8 NewCastle, Pa. (17) B4 5.4
Bridgeport, Conn. N1983.00 Buffalo R278.00	Lackawanna, N.Y. B24.30 Los Angeles B34.95	So.Chicago R2, U5, W14 4.225 SparrowsPoint, Md. B24.225	Portland, Oreg. 045.05 Seattle B3, N14, P235.05	Pittsburgh J55.4 Plymouth, Mich. P55.6
Canton, O. R280.00 Clairton, Pa. U578.00	Minnequa, Colo. C104.70 Munhall, Pa. U54.25	Steubenville, O. W104.225 Warren, O. R24.225	So.Chicago R2,U5,W144.30 So.Duquesne,Pa. U54.30	Putnam, Conn. W18 5.9
Conshohocken, Pa. A383.00 Ensley, Ala. T278.00	Niles, Calif. P14.90 Portland, Oreg. O45.00	Weirton, W. Va. W64.225 Youngstown R2, U5, Y14.225	So.SanFran., Calif. B35.05 Sterling, Ill. (1) N154.30	Readville, Mass. C145.3 So. Chicago, Ill. W145.4
Fairfield, Ala. T278.00 Fontana, Calif. K186.00	Phoenixville, Pa 4.20 Seattle B3 5.00	10418500111 102,00,11	Sterling, Ill. N154.40	SpringCity, Pa. K35.8 Struthers, O. Y15.4
Gary, Ind. U578.00 Geneva, Utah C1178.00	So.Chicago U5, W144.25 So.SanFrancisco B34.90	PLATES, Carbon Abras. Resist.	Struthers, O. Y14.30 Torrance, Calif. C115.00	Waukegan, Ill. A75.4 Worcester, Mass. W19 5.3
Houston S583.00	Torrance, Calif. C114.95	Fontana, Calif. K16.025 Geneva, Utah C115.375	Warren, O. R2	Youngstown F3, Y15.4
Johnstown,Pa. B278.00 Lackawanna,N.Y. B278.00	Weirton, W. Va. W64.25	DIATES W. L. I	Youngstown R2, U54.30	BARS, Cold-Finished Carbon (Turned and Ground)
Los Angeles B3	Wide Flange Bethlehem,Pa. B24.30	PLATES, Wrought Iron Economy, Pa. B149.80	BARS, Hot-Rolled Alloy Bethlehem, Pa. B25.075	Cumberland, Md. (5) C19.4.6
Munhall, Pa. U578.00 Pittsburgh J578.00	Clairton, Pa. U54.25 Fontana, Calif. K15.25	isomonis,i a, isi , , , , , , , , , , , , , , , , ,	Bridgeport, Conn. N195.225 Buffalo R25.075	BARS, Cold-Finished Alloy Ambridge, Pa. W186.82
Seattle B3	Lackawanna N.Y B2 4.30	PLATES, High-Strength Low-Alloy	Canton, O. R2, T75.075 Clairton, Pa. U55.075	BeaverFalls, Pa. M12, R2 6.62
So.Duquesne,Pa. U578.00 So.SanFrancisco B387.50	Munhall, Pa. U54.25 Phoenix ville, Pa. P44.30	Aliquippa, Pa. J 56.45 Bessemer, Ala. T2 6.45	Detroit R7	Bethlehem, Pa. B26.6. Buffalo B56.6
Alloy, Forging (NT)	So.Chicago, Ill. U54.25	Clairton, Pa. U56.45 Cleveland J5, R26.45	Fontana, Calif. K16.125	Camden, N.J. P136.8 Canton, O. T76.64
Bethlehem, Pa. B2 \$86.00 Buffalo R286.00	Alloy Stand. Shapes	Coatesville, Pa. L76.45 Conshohocken, Pa. A36.45	FairlessHills,Pa. U55.225 Gary,Ind. U55.075	Carnegie, Pa. C126.62 Chicago W186.62
Canton, O. R2, T786.00 Conshohocken, Pa. A393.00	Clairton, Pa. U55.20 Fontana, Calif. K16.60	Ecorse, Mich. G56.55 Fairfield, Ala. T26.45	Houston S55.325 Ind.Harbor,Ind. I-2, Y1.5.075	Cleveland A7, C206.6.2 Detroit R76.6
Detroit R786.00	Gary, Ind. U5	Fontana, Calif. (30) K1 7.15 Gary, Ind. U5 6.45	Johnstown, Pa. B25.075 Kansas City, Mo. S55.325	Detroit B5, P176.85 Donora, Pa. A76.65
Fontana, Calif. K1105.00 Gary, Ind. U586.00	Munhall, Pa. U55.20 So. Chicago, Ill. U55.20	Geneva, Utah C116.45 Houston S56.50	Lackawanna, N.Y. B25.075 Los Angeles B36.125	Elyria, O. W8 6.65 Gary, Ind. R2 6.65
Houston S5	H.S., L.A. Stand, Shapes	Ind.Harbor,Ind. I-2, Y1.6.45 Johnstown,Pa. B26.45	Massillon, O. R25.075 Midland, Pa. C185.075	GreenBay, Wis. F76.6 Hammond, Ind. L2, M13.6.6
Johnstown, Pa. B286.00 Lackawanna, N.Y. B286.00	Aliquippa, Pa. J56.40	Lackawanna, N.Y. B26.45 Los Angeles B37.35	So. Chicago R2, U5, W145.075 So. Duquesne, Pa. U55.075	Hartford, Conn. R26.91 Harvey, Ill. B56.65
LosAngeles B3106.00 Massillon,O. R286.00	Bessemer, Ala. T26.40 Bethlehem, Pa. B26.45	Munhall,Pa. U56.45 Pittsburgh J56.45	Struthers, O. Y15.075 Warren, O. C175.075	Lackawanna, N.Y. B2 6.6"
Midland, Pa. C1886.00 Munhall, Pa. U586.00	Clairton, Pa. U5 6.40 Fairfield, Ala. T2 6.40	Seattle B3	Youngstown U55.075	LosAngeles S308. Mansfield, Mass. B56.9
So.Chicago R2, U5, W14. 86.00 So.Duquesne, Pa. U5 86.00	Fontana, Calif. K17.05 Gary, Ind. U56.40	Sharon,Pa. S36.45 So.Chicago,Ill. U5, W14.6.45 SparrowsPoint,Md. B26.45	BARS, H.R. Leaded Alloy Warren, O. C175.825	Massillon, O. R2, R8 6.6 Midland, Pa. C18 6.6
Struthers, O. Y186.00 Warren, O. C1786.00	Geneva, Utah C116.40 Houston S56.45	SparrowsPoint,Md. B26.45 Youngstown U5, Y16.45	BARS & SMALL SHAPES, H.R.	Monaca, Pa. S17 6 6 Newark, N.J. W18 6.
ROUNDS, SEAMLESS TUBE (NT)	Ind.Harbor,Ind. I-2, Y1.6.40 Johnstown,Pa. B26.45	PLATES AU-	High-Strength Low-Alloy Aliquippa, Pa. J56.45	Plymouth, Mich. P56.8: So. Chicago W146.6
Buffalo R2\$96.50 Canton, O. R296.50	KansasCity, Mo. S56.45	PLATES, Alloy Claymont, Del. C225.80	Bessemer, Ala. T26.45	SpringCity, Pa. K36.3 Struthers, O. Y16.62
Cleveland R296.50 Gary,Ind. U596.50	Lackawanna, N.Y. B26.45 Los Angeles B37.10	Coatesville, Pa. L75.80 Fontana, Calif. K16.45	Bethlehem, Pa. B26.45 Clairton, Pa. U56.45	Warren, O. C17 6.65 Waukegan, Ill. A7 6.65
So.Chicago R2, W14 96.50 So.Duquesne, Pa. U5 96.50	Munhall, Pa. U56.40 Seattle B37.15	Gary, Ind. U5	Cleveland R26.45 Ecorse, Mich, G56.55	Worcester, Mass. A76.92 Youngstown F3, Y16.62
SKELP	So. Chicago, Ill, U5, W14.6.40 So. San Francisco B37.05	Ind.Harbor,Ind. Y15.80 Johnstown,Pa. B25.80	Fairfield, Ala. T2 6.45 Fontana, Calif. K1 7.70	BARS, C.F. Leaded Alloy
Aliquippa,Pa. J54.00	Struthers, O. Y16.40	Munhall, Pa. U55.80	Gary, Ind. U5	Ambridge, Pa. W187.52 Camden, N.J. P137.52
Fontana, Calif. K14.775 LoneStar, Tex. L64.30	H.S., L.A. Wide Flange Rethlehem Pa R2 6 45	Newport, Ky. N95.80 Seattle B36.70	Ind. Harb., Ind. I-2, Y16.45 Johnstown, Pa. B26.45	Carnegie, Pa. C12 7.52 Chicago W18 7.52
Munhall, Pa. U53.90 SparrowsPoint, Md. B23.90	Bethlehem, Pa. B26.45 Lackawanna, N.Y. B26.45	Sharon, Pa. S35.80 So. Chicago, Ill. U5, W14.5.80	KansasCity, Mo. S56.70 Lackawanna, N.Y. B26.45	Cleveland C20
Warren, O. R23.90 Youngstown R2, U53.90	Munhall, Pa. U56.40 So. Chicago, Ill. U56.40	SparrowsPoint,Md. B25.80 Youngstown Y15.80	Los Angeles B37.15 Pittsburgh J56.45	Newark, N.J. W187
WIRE RODS		FLOOR PLATES	Seattle B3	SpringCity,Pa. K37.5 Warren,O. C17 7.52
AlabamaCity, Ala. R24.675 Aliquippa, Pa. J5 4.675	PILING	Cleveland J55.275	So.Duquesne, Pa. U5 6.45 So.SanFrancisco B3 7.20	BARS, Reinforcing (To Fabricators)
Alton,Ill. L14.85 Buffalo B11, W124.675		Conshohocken, Pa. A35.275 Harrisburg, Pa. C55.275	Struthers, O. Y16.45	Ala.City, Ala. R24.3
Cleveland A74.675 Donora,Pa. A74.675	Munhall, Pa. U54.25	Ind.Harbor,Ind. I-25.275 Munhall,Pa. U55.275	Warren, O. R2	Atlanta A114.5 Birmingham C154.5
Fairfield, Ala. T24.675 Fontana, Calif. K15.475	So. Chicago, Ill. U54.25	So. Chicago, Ill. U55.275	BAR SIZE ANGLES; H.R. Carbon	Buffalo R2 4.5 Cleveland R2 4.5
Houston S54.925 IndianaHarbor, Ind. Y1 .4.675	STEEL SHEET PILING	PLATES, Ingot Iron	Bethlehem, Pa. B24.45	Fairfield, Ala. T24.5
Johnstown, Pa. B2 4.675 Joliet, Ill. A7 4.675	Ind. Harbor, Ind. I-25.075	Ashland c.l. (15) A104.475	BAR SIZE ANGLES; S. Shapes Aliquippa, Pa. J54.30	FairlessHills, Pa. U54.4 Fontana, Calif. K15.0
KansasCity, Mo. S54.925	Munhall.Pa. U5 5.075	Ashland 1.c.l. (15) A10.4.975 Cleveland c.l. R24.825	Atlanta A114.50	Ft. Worth, Tex. (42) T4 4.5
Kokomo,Ind. C164.775	so. Chicago, IN. U55.075	Warren, O. c.l. R24.825	Niles, Calif. P15.00	Houston S54.5
154				
154				/TEEL

Glarbor,Ind. I-2, Y1 4.30 Stown,Pa. B2	SHEETS, Hot-Rolled Steel (18 Gage and Heavier) Ala.City, Ala. R2	Lackawanna(35) B2 6.10 Munhall,Pa. U5 6.10 Pittsburgh J5 6.10 Sharon,Pa. S3 6.10 Warren,O. R2 6.10 Warren,O. R2 6.10 Weirton,W.Va. W6 6.10 Youngstown U5, Y1 6.10 SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier) Ashland,Ky.(8) A10 4.30 Cleveland R2 4.65 Ind.Harbor,Ind. I-2 4.65 Ind.Harbor,Ind. I-2 4.65 SHEETS, Cold-Rolled Steel (Commercial Quality) Allenport,Pa. P7 4.95 Cleveland J5, R2 4.95 Conshohocken,Pa. A3 5.00 Dravosburg,Pa. U5 4.95 FairlesHills,Pa. U5 5.00 Follansbee,W.Va. F4 4.95 FairlessHills,Pa. U5 5.00 Follansbee,W.Va. F4 4.95 Forntana,Calif. K1 6.05 Garny,Ind. U5 4.95 GraniteCity,Ill. G4 5.15 Ind.Harbor,Ind. I-2, Y1.4.95 Lackawanna,N.Y. B2 4.95 Middletown,O. A10 4.95 Newport,Ky. N9 4.95 Niddletown,O. A10 4.95 Newport,Ky. N9 4.95 Portsmouth,O. P12 4.95 SparrowsPoint,Md. B2 4.95 Warren,O. R2 4.95 Weirton,W.Va. W6 4.95 Warren,O. R2 4.95 Weirton,W.Va. W6 4.95 Youngstown Y1 4.95 SHEETS, Cold-Rolled High-Strength Low-Alloy Cleveland J5, R2 7.50 Ecorse,Mich. G5 7.60 FairlessHills,Pa. U5 7.55 Ecorse,Mich. G5 7.60 FairlessHills,Pa. U5 7.55 Clanana,Calif. K1 8.55 Gary,Ind. U5 7.50 Indianal-Aurobor,Ind. Y1 7.50	### SHEETS, Cold-Rolled Ingot Iron Cleveland R2	High-Strength Low-Alloy Dravosburg, Pa. U5 8.20 SparrowsPoint (30) B2 8.20 SparrowsPoint (30) B2 8.20 Sheets, Galvannealed Steel Canton, O. R2 5.85 Dravosburg, Pa. U5 5.85 Kokomon, Ind. C16 6.20 Newport, Ky. N9 5.85 Niles, O. N12 5.85 SHEETS, Galvanized Ingot Iron Ashland, Ky. (8) A10 5.70 Canton, O. R2 6.20 SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous) Ashland, Ky. A10 5.70 Butler, Pa. A10 5.70 Middletown, O. A10 5.70 SHEETS, Electrogalvanized Cleveland (28) R2 6.30 Niles, O. (28) R2 6.30 Weirton, W. Va. W6 6.15 SHEETS, Aluminum Coated Butler, Pa. A10 8.625 SHEETS, Aluminum Coated Butler, Pa. A10 5.375 Cleveland R2 5.375 Dravosburg, Pa. U5 5.375 GraniteCity, Ill. G4 5.375 Ind. Harbor, Ind. I-2 5.375 Niles, O. N12 5.375 Niles, O. N12 5.375 Niles, O. N12 5.375 SHEETS, Long Terne Steel (Commercial Quolity) BeechBottom, W. Va. W1 5.85 Gary, Ind. U5 5.85 Mansfield, O. E6 5.85 Mansfield, O. E6 5.85 Miles, O. N12 5.85
momy, Fa. (D. R.) B14 13.50 momy (Staybolt) B14 13.80 C.Rks (S. R.) L5 10.85 C.Rks. (D.R.) L5 14.75 C.Rks. (Staybolt) L5 16.25	Ecorse, Mich. G5 6.20 Fairfield, Ala T2 6.10 Fairfield, FairlessHills, Pa. U5 6.15 Fontana, Calif. K1 6.875	Lackawanna (37) B27.50 Pittsburgh J57.50 SparrowsPoint (38) B27.50	tinuous.	Weirton, W. Va. W6 5.85 SHEETS, Long Terne, Ingot Iron
		—Key to Producers—		
Acme Steel Co. Alan Wood Steel Co. Allegheny Ludlum Steel Alloy Metal Wire Co. American Shim Steel Co. American Steel & Wire Anchor Drawn Steel Co. Angell Nail & Chaplet Armco Steel Corp. Atlantic Steel Co.	C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division C23 Charter Wire Inc.	I-7 Indiana Steel & Wire Co. J1 Jackson Iron & Steel Co. J3 Jessop Steel Co. J4 Johnson Steel & Wire Co. J5 Jones & Laughlin Steel J6 Joslyn Mfg. & Supply J7 Judson Steel Corp.	O3 Oliver Iron & Steel Corp. O4 Oregon Steel Mills P1 Pacific States Steel Corp. P2 Pacific Tube Co. P4 Phoenix Iron & Steel Co. P5 Pilgrim Drawn Steel	S19 Sweet's Steel Co. S20 Southern States Steel S23 Superior Tube Co. S25 Stainless Welded Products S26 Specialty Wire Co. Inc. S30 Sierra Drawn Steel Corp. T2 Tenn. Coal & Iron Div. T3 Tenn. Prod. & Chem. T4 Texas Steel Co.
Babcock & Wilcox Co. Bethlehem Steel Co. Beth. Pac. Coast Steel Blair Strip Steel Co. Bliss & Laughin Inc. Braeburn Alloy Steel Brainard Steel Div., Sharon Steel Corp. D. & G. Brooke, Wick-	Nail Co. D8 Damascus Tube Co. D9 Wilbur B. Driver Co. E1 Eastern Gas & Fuel Assoc.	K1 Kaiser Steel Corp. K2 Keokuk Electro-Metals K3 Keystone Drawn Steel K4 Keystone Steel & Wire K7 Kenmore Metals Corp. L1 Laclede Steel Co. L2 LaSalle Steel Co. L3 Latrobe Steel Co. L5 Lockhart Iron & Steel	P7 Pittsburgh Steel Co. P11 Pollak Steel Co. P12 Portsmouth Division Detroit Steel Corp. P13 Precision Drawn Steel P14 Pitts. Screw & Bolt Co. P15 Pittsburgh Metallurgical P16 Page Steel & Wire Div., Amer. Chain & Cable P17 Plymouth Steel Co. P19 Pitts. Rolling Mills	To Thomas Strip Division, Pittsburgh Steel Co. To Thompson Wire Co. Timken Roller Bearing To Tonawanda Iron Div. Am. Rad. & Stan. San. Til Tube Methods Inc. U4 Universal-Cyclops Steel U5 United States Steel Corp.
wire Spencer Steel Div. Colo. Fuel & Iron Buffalo Bolt Co., Div., Buffalo-Eclipse Corp. Buffalo Steel Corp. A. M. Byers Co. J. Bishop & Co.	E4 Electro Metallurgical Co. E5 Elliott Bros. Steel Co. E6 Empire Steel Corp. F2 Firth Sterling Inc. F3 Fitzsimons Steel Co.	L6 Lone Star Steel Co. L7 Lukens Steel Co. M1 McLouth Steel Corp. M4 Mahoning Valley Steel M6 Mercer Pipe Div., Saw-	P20 Prod. Steel Strip Corp. P22 Phoenix Mfg. Co. P23 Pacific Steel Rolling R1 Reeves Steel & Mfg. Co. R2 Republic Steel Corp. R3 Rhode Island Steel Corp.	U6 U. S. Pipe & Foundry U7 Ulbrich Stainless Steels U8 U. S. Steel Supply Div. V2 Vanadium-Alloys Steel V3 Vulcan Crucible Steel Co.
Calstrip Steel Corp. Calumet Steel Div., Borg-Warner Corp. Carpenter Steel Co. Central Iron & Steel Div. Barium Steel Corp. Cleve. Cold Rolling Mills Cold Metal Products Co.	G4 Granite City Steel Co.	M12 Moltrup Steel Products M13 Monarch Steel Div., Jones & Laughlin Steel Corp. M14 McInnes Steel Co. M16 Md. Fine & Special. Wire M17 Metal Forming Corp. M18 Milton Steel Prod. Div., Merritt-Chapman & Scott	R6 Rome Strip Steel Co. R7 Rotary Electric Steel Co. R8 RelianceDiv. EatonMfg. R9 Rome Mfg. Co. R10 Rodney Metals Inc. S1 Seneca Wire & Mfg. Co. S3 Sharon Steel Corp. S4 Sharon Tube Co.	W1 Wallace Barnes Co. W2 Wallingford Steel Co. W3 Washburn Wire Co. W4 Washington Steel Corp. W6 Weirton Steel Co. W7 W. Va. Steel&Mfg. Co. W8 West.Auto.Mach.Screw W9 Wheatland Tube Co. W10 Wheeling Steel Corp.
Colonial Steel Co. Colorado Fuel & Iron Columbia-Geneva Steel Columbia Steel & Shaft. Columbia Tool Steel Co. Compressed Steel Shaft. Connors Steel Dlv. H. K. Porter Co. Inc. Continental Steel Corp. Copperweld Steel Co.	G5 Great Lakes Steel Corp. G6 Greer Steel Co. H1 Hanna Furnace Corp. H7 Helical Tube Co. I-1 Igoe Bros. Inc. I-2 Inland Steel Co.	N1 National-Standard Co. N2 National Supply Co. N3 National Tube Div. N5 Nelsen Steel & Wire Co. N6 NewEng.High Carb.Wire N8 Newman-Crosby Steel N9 Newport Steel Corp. N12 Niles Rolling Mill Div. N14 Northwest SteelRoll Mills	Armco Steel Corp. Se Shenango Furnace Co. Sr Simmons Co. St Simonds Saw & Steel Co. S12 Spencer Wire Corp. S13 Standard Forgings Corp. S14 Standard Tube Co. S15 Stanley Works S17 Superior Drawn Steel Co.	W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron W13 Wilson Steel & Wire Co. W14 Wisconsin Steel Div., International Harvester W15 Woodward Iron Co. W18 Wyckoff Steel Co. W19 Worcester Pressed Steel
Copperweld Steel Co.	Borg-Warner Corp.	N15 Northwestern S.&W. Co.	S18 Superior Steel Corp.	Y1 Youngstown Sheet&Tube

	7 Or Dittehungh II 8 601	TIN MILL PRODUCTS
STRIP	Riverdale, Ill. A15.85 Pittsburgh J58.60 Rome, N.Y. (32) R65.75 Sharon, Pa. S38.60	
STRIP, Hot-Rolled Carbon	Sharon, Pa. S35.75 SparrowsPoint, Md. B28.423 SparrowsPt Md. B28.60	Aliquippa Pa. J5 \$7.50 \$7.75 \$8.15
Ala.City, Ala. (27) R24.05	Trenton N I (31) R5 7.30 Weirton, W. Va. W6 8.60	Dravosburg, Pa. U5 7.50 7.75 8.15 Fairfield, Ala. T2 7.60 7.85 8.25
Allenport, Pa. P74.05	Warren, O. B9, R2, T55.75 STRIP, Cold-Rolled Ingot Iron	FairlessHills, Pa. U5 7.60 7.85 8.25
Alton, Ill. L14.225 Ashland, Ky. (8) A104.05	Weirton, W. Va. W6 5.75 Warren, O. R2 6.35 Worcester, Mass. A7 6.60	GraniteCity, Ill. G4 7.60 7.85 8.25
Atlanta A114.25 Bessemer, Ala. T24.05	Youngstown C8, Y15.75 STRIP, Electrogalvanized	IndianaHarbor, Ind. I-2, Y1 7.50 7.75 8.15 Niles, O. R2 7.50 7.75 8.15
Birmingham C154.05 Bridgeport, Conn. N194.35		Pittsburg.Callf, C11 8.25 8.50 8.90 SparrowsPoint,Md. B2 7.60 7.85 8.25
Buffalo(27) R24.05	Carnegie, Pa. S1812.45 Riverdale, Ill. A15.85*	Weirton, W. Va. W6 7.50 7.75 8.1
Conshohocken, Pa. A34.10 Detroit M14.15	Dover O C6 12 45 Warren, O. B9, T5 5.75*	Yorkville, O. W10
Fairfield Ala T2 4.15	Fontana, Calif. K114.55 Wellton, W. Va. Wolfton, W. Va. Wolffon, W. Wolf	Aliquippa, Pa. J5 6.175
Fontana.Cant. K14.825	Harrison, N.J. C1812.45 Pawtucket, R.I. N812.80 *Plus galvanizing extras.	Niles, O. R2
ING. Harbor, Ing. 1-2. Y 1.4.05	Charan Da C2 19 45	Coke (Base Box) b Yorkville, O. W106.6
Lackaw'na, N.Y. (25) B2 4.05	Worcester Mass. A712.75 Strip, Galvanized Youngstown C812.90 (Continuous)	Aliquippa, Pa, J5\$8.80 \$9.05 Drawaburg Pa, J5.8.80 9.05 HOLLOWARE ENAMELING
Milton, Pa. M184.80	~: D- CD 6.15	Fairfield, Ala. T2. 8.90 9.15 Black Plate (29 Gage)
Minnequa, Colo. C105.15 N. Tonawanda, N.Y. B114.05	Cleveland A7 I5 860	Gary.Ind. U5 8.80 9.05 Follansbee, W. Va. F4 8.24
Fittsburg, Calif. Cill 4 xii	Cleveland Af, J5	Ind. Har. I-2, Y1 8.80 9.05 Gary, Ind. U5
Mayerdale, III. Al 4.00	Ecorse Mich G5 8 70 Riverdale III A14.b20	Sp.Pt., Md. B2 8.90 9.15 Ind. Harbor, Ind. Y1 6.2- Warren, O. R2 8.80 9.05 Yorkville, O. W10 6.20
#eattle(25) B3, P235.05	Ind. Harbor, Ind. Y1 8.60 Sharon, Pa. S34.475 Lackawanna, N.Y. B28.425 Youngstown U54.475	Weirton, W. Va. W6 8.80 9.05 Yorkville, O. W10. 8.80 9.05 MANUFACTURING TERNES
Sharon.Pa. S3 4 05	STRIP, Cold-Finished 0.26- 0.41- 0.61- 0.81- 1.06-	BLACK PLATE (Base Box) (Special Coated; Base Box)
Bo.Chicago,Ill. W144.05 Bo.SanFrancisco(25) B3.4.80	Spring Steel (Annealed) 0.40C 0.60C 0.80C 1.05C 1.35C1	Allquippa, Pa. J5\$6.60 Dravosburg, Pa. U5\$7.80
bparrowsPoint, Md. B2 4.05	Roston T6 830 835 930 11.45 14.151	Fairfield, Ala. T26.70 Yorkville, O. W107.85
btering, in. Nib 4 15	Bristol, Conn. W1 9.30 11.45 Carnegie, Pa. 818 8.05 9.00 11.15 13.85	FairlessHills, Pa. U56.70 Gary, Ind. U56.60 MANUFACTURING TERNES (Light Costed 6 lb. Rece Back)
Warren, O. R2 4.80	Cleveland A7 5.75 8.05 9.00 11.15 13.85	GraniteCity.III. G46.70 (Light Coated, 6 lb; Base Box) Ind. Harbor, Ind. I-2, Y1.6.60 Yorkville, O. W10\$8.76
	Dearborn, Mich. D3 5.85 8.25 9.20	Niles.O. R26.60
	Dover.O. G6 5.85 8.05 9.00 11.15 13.85	Pittsburg, Calif. C117.35 ROOFING SHORT TERNES SparrowsPoint, Md. B26.70 (8 lb Coated)
\$TRIP, Hot-Rolled Alloy	FranklinPark, Iil. T6 5.85 8.05 9.00 11.15 13.85 Harrison, N.J. C18 9.30 11.45 14.15	Warren.O. R26.60 Gary, Ind. U59.85
Bridgeport.Conn. N197.00	Indianapolis C8 6.00 8.20 9.00 11.15 13.85 NewBritain, Conn. (10) 815 5.75 8.05 9.00 11.15 13.85	WIRE Alton, Ill. L1 7.075 Buffalo W12 6.96
Fontana, Calif. K18.10	NewCastle, Pa. B4 5.75 8.05 9.00 11.15	Wille Manufactures Bright Cleveland A76.90
Gary, Ind. U5	NewHaven, Conn. D2 5.20 8.35 9.30 11.25	Low Carbon Duluth, Minn. A76.90
Newport, Ky. N9 6.70	NewYork W3 8.35 9.30 11.45 14.15	Allquippa,Pa. J55.75 Johnstown,Pa. B2
Beattle P23	Pawtucket, R.I. N8 6.30 8.35 9.30 11.45 14.15 Riverdale, Ill. A1 5.85 8.05 9.00 11.15 13.85	Atlanta All
80. Chicago W14	Rome, N.Y. (32) R6 5.75 8.05 9.00 10.95 13.25 Sharon, Pa. S3 5.75 8.05 9.00 11.15 13.85	Buffalo W12
20angstown 05, 116.70	Trenton, N.J. R5 8.35 9.30 11.45 14.15	Claveland A7 C20 5.75 Palmer, Mass. W127.21
STRIP, Hot-Rolled	Wallingford, Conn, W2 6.20 8.35 9.30 11.45 14.15 Warren, O. T5 5.75 8.05 9.00 11.15 13.85	Crawfordsville, Ind. M8. 5.85 Portsmouth, O. P126.9
High-Strength Low-Alloy	Weirton, W. Va. W6 5.75 8.65 9.00 11.15 13.85 Worcester, Mass. A7, T6 6.60 8.35 9.30 11.45 14.15	Duluth Minn. A7 5.75 Roebling, N.J. R5 7.2 Fairfield, Ala. T2 5.75 So. Chicago, Ill. R2 6.51
Bessemer, Ala. T26.15 Conshohocken, Pa. A36.15	Youngstown C8 5.85 8.05 9.00 11.15 13.85	Fostoria, O. (24) S15.95 Soldan Paristo City
Ecorse, Mich. G56.25 Fairfield, Ala. T26.15		Jacksonville.Fla. M86.27 Struthers, O. Y16.9
Gary.Ind U5	Buffalo W12 12.90	Johnstown, Pa. B2 5.75 Trenton, N.J. A7 7.21 Johnstown, Pa. B2 5.75 Waukegan, Ill. A7 6.91 Johnstown, Pa. B2
Ind. Harbor, Ind I.2 VI 6 15	Harrison, N.J. C18 12.90 15.60 19.00	KansasCity, Mo. S56.00 Worcester, Mass. A77.2 Kokomo, Ind. C165.85 WIRE, Fine & Weaving (8" Coils
KansasCity, Mo. S56.40 Lackawanna. N.Y. B26.15	2101120111 110 111111111111111111111111	LosAngeles B36.70 Alton, Ill. L111.37
LOSABreles (25) P2 con	Worcester, Mass. A7, T6 12.90 15.60 19.00	Minnequa.Colo. C106.00 Bartonville,Ill. K411.2 Monessen,Pa. P75.75 Buffalo W1211.2
Snaron, Pa. S3	10ungstown Co 13.20 13.95 19.30	Newark 6-8 ga. I-16.40 Chicago W1311.2 No.Tonawanda B115.75 Cleveland A711.2
SparrowsPoint Md P2 6.15	SILICON STEEL	Palmer, Mass. W126.05 Crawfordsville, Ind. M8.11.3 Pittsburg, Calif. C116.70 Fostoria, O. S111.2
Warren, O. R26.15 Weirton W Va W6	Arma- Elec- Dyna-	Portsmouth, O. P125.75 Jacksonville, Fla. M811.7 Rankin, Pa. A75.75 Johnstown, Pa. B211.2
Youngstown U5, Y16.15	BeechBottom, W. Va. W10 9.10 10.10 11.00	So, Chicago, Ill. R2 5.75 Kokomo, Ind. C16 11.2
STRIP, Hot-Rolled Ingot Iron	Brackenridge, Pa. A4	So, San Francisco C106.70 Minnequa, Colo. C1010.6 Sparrows Point, Md. B25.85 Monessen, Pa. P1611.2 Sterling, Ill. (1) N155.75 Muncle, Ind. I-711.4
Ashland, Ky. (8) A10 4 30	Newport, Ky. N9 8.025 8.50 9.10 10.10 11.00	Sterling. III. N15 5.85 Palmer, Mass. W12 11.8
Warren, O. R24.65	Vandergrift, Pa. U5 8.50 9.10 10.10 11.00	Struthers, O. Y15.75 Roebling, N.J. R511.5 Waukegan, III. A75.75 So. San Francisco C1011.5
STRIP, Cold-Rolled Carbon	Warren,O, R2 8.025 8.50 9.10 10.10 11.00 Zanesville,O, A10 8.50 9.10 10.10 11.00	Worcester, Mass. A76.05 Waukegan, Ill. A711.2
Anderson, Ind. G6 5 75	C.R. COILS & CUT LENGTHS, (22 Ga.)	WIRE, MB Spring, High Carbon Worcester, Mass. A7, T6.11.5 Aliquippa.Pa. J57.20 WIRE, Galv'd ACSR for Cores
Baltimore T65.75 Boston T66.30	Fully Processed Arma- Elec- Dyna-	Alton, Ili. L1
Cleveland A7, J55.75	Brackenridge.Pa. A4 9.85 10.85 11.75	Buffalo W127.20 Johnstown Pa. B29.9
Conshohocken, Pa. A35.80 Dearborn, Mich. D35.85	IndianaHarbor, Ind. I-2 8.225 8.75* 9.35*	Cleveland A77.20 Minnequa, Colo. C1010.02 Donora.Pa. A77.20 Monessen, Pa. P169.9
Detroit D2, M1, P205.85 Dover, O. G65.75	Vandergrift.Pa. U5 9.25†9.85†10.85†11.75†	Duluth, Minn. A77.20 Muncie, Ind. I-710.1 Fostoria, O. S17.20 Portsmouth, O. P129.9
Ecorse, Mich. G55.85	Warren, O. R2 8.225†9.25 9.85 10.85 11.75	Johnstown, Pa. B27.20 Roebling, N.J. R510.2 Los Angeles B38.15 Sparrows Pt., Md. B210.0
Fontana, Calif. K1 7.50	Zanesville, O. A10	Milbury, Mass. (12) N6 7.50 POPE WIRE
FranklinPark, Ill. T65.85 Ind. Harbor, Ind. I-25.85	H.R. SHEETS (22 Ga., cut lengths) T-72 T-65 T-58 T-52	
Ind.Harbor,Ind. I-2 5.85 Ind.Harbor,Ind. Y1 5.75 Indianapolis C8 5.90	BeechBottom, W.Va. W10 11.95 12.50 13.00 14.00 Brackenridge, Pa. A4 11.95	Muncie, Ind. I-77.40 Buffalo W129.7 Palmer, Mass. W127.50 Fostoria O S19.7
LosAngeles C17.80	Newport, Ky. N9 11.95	Pittsburg, Calif. C118.15 Johnstown, Pa. B29.7
Middletown, O. A105.75 NewBedford, Mass. R106.20	Zanesville, O. A10	Roebling, N.J. R57.50 Muncie, Ind. I-79.9
NewBritain(10) S155.75 NewCastle,Pa. B4, E55.75	C.K. COILS & COI LENGTHS ——Grain Oriented——	So. SanFrancisco C108.15 Portsmouth O P129.7
NewHaven, Conn. A76.50	(22 Ga.) T-100 T-90 T-80 T-73 T-72 Brackenridge,Pa, A4 15.00 16.60 17.10	SparrowsPt., Md. B2 7.30 Roobling N I P5 100
NewKensington, Pa. A65.75	Butler, Pa. A10 16.60 17.10	Struthers, O. Y1 7.20 Sparrows Pt. B2 9.8 Trenton, N.J. A7 7.50 Struthers, O. Y1 9.7 Waukegan, Ill. A7 7.20 Worgester Wass 76 9.6
Pawtucket, R.I. R36.40 Pawtucket, R.I. N86.30	Warren, O. R2	Worcester A7, J4, T6, W12. 7.50 Worcester, Mass. J4 10.0
Pittsburgh J55.75 Portsmouth, O. P125.75		WIRE, Upholstery Spring (A) Plow and Mild Plow Aliquippa, Pa. J56.90 add 0.25c for Improved Plow
		1 The state of the

WIRE	Donora, Pa. A7159†	BOLTS, NUTS	DOUBLE THE TOTAL OF THE TOTAL O	
(Continued)	Duluth.Minn. A7159† Fairfield, Ala. T2159†	CARRIAGE, MACHINE BOLTS	Net base of prices dollars	s per 100 ft, mill; minimum
(Tire Bead (Houston, Tex. S5164†	(Base discounts, per cent off	wall thickness, cut lengths	10 to 24 ft, inclusive.
sannville. Ill. K413.25	Joliet, Ill A7 159† Kansas City, Mo. S5 164†	list, f.o.b. midwestern plants) 4 in. and shorter:	In. Gage H.R	Seamless
i. ssen.Pa. P1613.15 mouth.O. P1213.15	Kokomo, Ind. C16 161†	½-in. & smaller diam 2	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
ing.N.J. R513.45	Minnequa.Colo. C10164. Monessen.Pa. P7162	Over 4 in, through 6 in,: 1/2 in. & smaller diam +3	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	0 25.65 20.75
Extraon, Ind. G67.95	Pittsburg, Calif. C11179† Rankin, Pa. A7159†	6 in. and shorter:	2 13 23.33	3 33.97 27.48
more T68.25 % lo W127.95	So.Chicago, Ill. R2 159**	18-in. and %-in +4 %-in. and larger +6 Longer than 6 in.:	121/4 12 34.63	3 41.52 33.59
# land A77.95	SparrowsPoint, Md. B2164*	All diameters+15	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	
13/r.O. G67.95	Sterling, Ill. (1) N15163	Lag bolts, all diams: 6 in. and shorter 6	3 12 44.08	5 52.82 42.72
1) ria, O. S17.95 12 klinPark, Ill. T6 8.05	†Based on 5c zinc; *11c zinc; \$10c zinc; **Subject to	Over 6 in. long +2 Ribbed Necked Carriage +4	RAILWAY MATERIALS	Standard Tee Rails
mo,Ind. C168.05 illon.O. R87.95	-	Plow 10	RAILS	No. 1 No. 2 No. 2 Under
aukee C238.15	WIRE (16 Gage) An'id Galv. Stone Stone	Step, Elevator, Tap and Sleigh Shoe 10	Bessemer, Pa. U5 Ensley, Ala. T2	4.45 4.35 4.40 5.35 4.45 4.35 5.35
**************************************	Ala.City R213.15 14.70** Bartonville K413.25 15.15	Tire Bolts +3 Boiler & Fitting-Up Bolts 21	Fairfield, Ala. T2	4.45 4.35 4.40
ton.N.J. R58.25 the ester A7, T6, W12.8.25			IndianaHarbor,Ind. I-2 Johnstown,Pa. B2	4.45 4.35 4.40 (16)5.35
ester A7, T6, W12.8.25 Merchant Quality	Crawindsville M8 13.25 15.10	NUTS H.P. and C.P., regular &	Lackawanna, N.Y. B2 Minnequa, Colo. C10	4.45 4.35 5.35 4.45 4.35 5.85
ito 8 gage) An'id Galv.		heavy: Square, all sizes 55	Steelton, Pa. B2	4.45 4.35 5.35
Elity, Ala. R26.90 7.30**	Minnequa C1013.40 15.10**	H.P., Hex, regular & heavy: %" and smaller 55	TIE PLATES	JOINT BARS
nta A117.00 7.55	Palmer. Mas. W12 13.15 14.70† Pitts., Calif. C11 13.50 15.05†	%" to 1%", inclusive 58 1%" to 1%", inclusive 60	Fairfield, Ala. T25.275 Gary, Ind. U55.275	Bessemer.Pa. U55.425 Fairfield,Ala. T25.425
alo W126.90 7.30†	SparrowsPt. B2.13.25 15.10*	1%" and larger 55	Ind. Harbor, Ind. I-2 5.275 Lackawanna, N.Y. B2 5.275	Ind. Harbor, Ind. I-2 5.425 Jollet, Ill. U5 5.425
n vfordsville M8.7.00 7.55	Sterling(1) N15.13.15 15.05 Waukegan A713.15 14.70†	C.P. Hex regular & heavy: All sizes 55	Minnequa, Colo. C105.275	Lackawanna.N.Y. B25.425
ina, Pa. A76.90 7.30† th, Minn. A76.90 7.30†	Worcester A713.45	Hot Galv. Nuts (all types): %" or smaller 38	Seattle B35.425 Steelton, Pa. B25.275	Minnequa, Colo. C105.425 Steelton, Pa. B25.425
field T26.90 7.30† ston, Tex. S57.15 7.55†	*Based on 11c zinc; †5c	%" to 1%", inclusive 41 Finished Hex Nuts:	Torrance, Calif. C115.425	SCREW SPIKES
s'ville,Fla, M8 7.425 7.95 stownB2(48), 6.90 7.45*	zinc; §10c zinc; **Subject to zinc equalization extras.	New standard, all sizes 55 Semifinished & Slotted Hex:	TRACK BOLTS (20) Treated	Cleveland R211.00 STANDARD TRACK SPIKES
It.Ill. A76.90 7.30† sasCity, Mo. S5 7.15 7.55†	NAILS, Stock To Dealers & Mfrs. (7) Col.	Regular and heavy,	Cleveland R211.50 KansasCity, Mo. S511.50	Fairfield, Ala. T27.30 Ind. Harbor, Ind. I-2, Y1 7.30
omo C167.00 7.40† Sangeles B37.85	To Dealers & Mfrs. (7) Col. AlabamaCity, Ala. R2137	all sizes 55	Lebanon, Pa. B211.50 Minnequa, Colo. C1011.50	KansasCity, Mo. S57.30
nequa C107.15 7.55** essen P7 (48).6.90 7.45	Aliquippa, Pa. J5137 Atlanta Al1139	SQUARE HEAD SET SCREWS (1035 steel; packaged; per	Pittsburgh 03, P1411.50 Seattle B312.00	Lebanon, Pa. B27.30 Minnequa, Colo. C107.30
Iner, Mass. W12.7.20 7.60†	Bartonville, Ill. K4139 Chicago, Ill. W13137	cent off list)		Pittsburgh J57.30 Seattle B27.80
3.,Calif. C117.85 8.25† c.smouth,O. P12 6.90	Cleveland A9142 Crawfordsville, Ind. M8139	1 in. diam x 6 in. and shorter 34	AXLES Ind. Harbor, Ind. S136.75	So.Chicago, Ill. R27.30 Struthers, O. Y17.30
kin A76.90 7.30† 1 hicago R26.90 7.30**	Donora.Pa. A7137	1 in. and smaller diam x over 6 in 20	Johnstown, Pa. B26.75	Youngstown R27.30
::.Fran. C107.85 8.25** ::wsPt.B2(48) .7.00 7.55*	Duluth, Minn. A7137 Fairfield, Ala. T2137	HEADLESS SET SCREWS	METAL POWDERS	Antimony, 500 lb lots 32.00*
ling(1)(48)N15 6.90 7.475 thers, O. (48)Y1.6.90 7.40‡	Houston, Tex. S5142	(Packaged; per cent off list)	(Per pound, f.o.b. shipping point in ton lots for minus	Brass, 5000-lb lots31.25-39.75†
cester, Mass. A7 7.20	Johnstown, Pa. B2137 Joliet, Ill. A7137	No. 10 and smaller 34 1/4 in. diam & larger 14	100 mesh, except as other- wise noted)	Bronze, 5000-lb lots51.50-54.75†
sed on 11c zinc; †5c ; ‡Less than 10c zinc;	KansasCity, Mo. S5142 Kokomo, Ind. C16139	N.F. thread, all diams 8	Sponge iron: Cents	
				Copper:
"ibject to zinc equaliza-	Minnequa, Colo. C10142	STEEL STOVE BOLTS	98+% Fe, annealed 15.25 Unannealed:	Copper: Electrolytic13.75* Reduced13.75*
"ibject to zinc equaliza- ii extras.	Minnequa, Colo. C10142 Monessen, Pa. P7137 Pittsburg, Calif. C11156	(F.o.b. plant, per cent off list in packages)	98+% Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25	Electrolytic13.75* Reduced13.75* Lead750*
*ibject to zinc equalizative extras. VEN Fence, 9-151/2 Ga. Col. City Ala R2 146**	Minnequa, Colo. C10142 Monessen, Pa. P7137 Pittsburg, Calif. C11156 Rankin, Pa. A7137 So, Chicago, Ill. R2137	(F.o.b. plant, per cent off	98+% Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y.,	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00
ibject to zinc equaliza- bextras. VEN Fence, 9-15½ Ga. Col. City, Ala. R2146 City 17 ga. R2241** City 18 ga. R2251*	Minnequa, Colo. C10142 Monessen, Pa. P7137 Pittsburg, Calif. C11156 Rankin, Pa. A7137 So, Chicago, Ill. R2137 SparrowsPt., Md. B2139 Sterling, Ill. (1) N15137	(F.o.b. plant, per cent off list in packages) Plain finish 43 Plated finishes 23	98+% Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y., c.l., in bags 11.25	Electrolytic13.75* Reduced13.75* Lead7.50* Manganese:
ibject to zinc equalizativentras. VEN Fence, 9-15½ Ga. Col. City, Ala. R2146 City, 17 ga. R2241** City, 18 ga. R2251** ppa,Pa.9-14½ga.J5 1498 nta Al1151	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish 43 Plated finishes 23 HEXAGON CAP SCREWS (1020 steel; packaged; per	98+% Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y., c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton,	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: 61.00 Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00
ibject to zinc equalizativentras. VEN Fence, 9-15½ Ga. Col. City, Ala. R2146 City, 17 ga. R2241** City, 18 ga. R2251** ppa,Pa.9-14½ga.J5 1498 nta Al1151	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y., c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship-	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel, Silver 5000-lb
*hject to zinc equaliza- *extras. VEN Fence, 9-15½ Ga. Col. City, Ala. R2146** City, 18 ga. R2251** 'ppa,Pa,9-14½ ga.J5 1498 tnta Al1151 tonville,Ill. K4152 wfordsville,Ind. M8151 opa,Pa, A7146†	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron:	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel-Silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze,
*ibject to zinc equaliza- *ivextras. **Jextras.** **Jex	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l. in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular frag-	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel-Silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 4.4-ton lots 58.50 Silicon 43.50
**Ibject to zinc equalizativen	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y., c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. shipping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular fragments of ½ in. x	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel-Silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 4/4-ton lots 58.50 Silicon 43.50 Solder 7.00* Stainless Steel, 302 94.00
ibject to zinc equaliza- f extras. VEN Fence, 9-15½ Ga. Col. City, Ala. R2146 City, Ala. R2241** City, 18 ga. R2251** "ppa,Pa.9-14½ga.J5 149\$ nnta A11151 tonville,Ill, K4152 wfordsville,Ind, M8151 ora,Pa. A7146† uth, Minn, A746† tfleid, Ala. T246† rfleid, Ala. T246† rfleid, Ala. T246† rston,Tex. S5151† nstown,Pa. (43) B2149 et, Ill, A7	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y., c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. shipping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular fragments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe . 36.50 Unannealed (99 + %	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel, unannealed 47.50-51.00 Phosphor-Bronze, 47.50-51.00 Silicon 43.50 Solder 7.00* Stainless Steel, 302 94.00 Stainless Steel, 316 41.25 Tin 14.50*
ibject to zinc equaliza- f extras. VEN Fence, 9-15½ Ga. Col. City, Ala. R2146 City, Ala. R2241** City 17 ga. R2251** City 18 ga. R2251** "jpa, Pa, 9-14½ ga. J5 149\$ Inta All	Minnequa, Colo. C10 .142 Monessen, Pa. P7 .137 Pittsburg, Calif. C11 .156 Rankin, Pa. A7 .137 So, Chicago, Ill. R2 .139 Sterling, Ill. (1) N15 .137 Worcester, Mass, A7 .143 NAILS, CUT (100 lb keg) To Dealers (33) Conshohocken, Pa. A3 .\$8.30 Wheeling, W. Va. W10 .8.30 STAPLES, Polished Stock To Dealers & Mfrs. (7) Col. Aliquippa, Pa. J5 .138 Atlanta A11 .140 Bartonville, Ill. K4 .139 Crawfordsville, Ind. M8 .139 Donora, Pa. A7 .138	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y., c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular frag- ments of % in. x 1.3 in, 21.00 Annealed, 99.5% Fe 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+%	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel-Silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, ¼-ton lots 58.50 Silicon 43.50 Solder 7.00* Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Tin 14.50* Zinc, 5000-lb lots 17.25-31.00‡ Tungsten Dollars
Ibject to zinc equaliza- **rextras. VEN Fence, 9-15½ Go. Col. City, Ala. R2	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular frag- ments of 1/2 in. x 1.3 in 21.00 Annealed, 99.5% Fe, 36.50 Unannealed (99+% Fe) 32.50	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel-Silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 4.40 Silicon 43.50 Solder 7.00* Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Tin 14.50* Zinc, 5000-lb lots 17.25-31.00 Tungsten Dollars Melting grade, 99% 60 to 200 mesh:
Ibject to zinc equaliza- **Textras. VEN Fence, 9-15½ Go. Col. City, Ala. R2	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y., c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular frag- ments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel-Silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 43.50 Silicon 43.50 Solder 7.00* Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Tin
Ibject to zinc equaliza- **Fextras. VEN Fence, 9-15½ Go. Col. City, Ala. R2	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y., c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular frag- ments of % in. x 1.3 in. 21.00 Annealed, 99.5% Fe. 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) 31.00 Carbonyl Iron:	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 35 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel-Silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 4-ton lots 58.50 Silicon 43.50 Solder 7.00* Stainless Steel, 302 94.00 Stainless Steel, 316 41.25 Tin 14.50* Zinc, 5000-lb lots 17.25-31.00; Tungsten Dollars Melting grade, 99% 60 to 200 mesh: 1000 lb and over 4.95 Less than 1000 lb 5.10 Chromium, electrolytic
Ibject to zinc equaliza- **rextras. VEN Fence, 9-15½ Go. Col. City, Ala. R2	Minnequa, Colo. C10 .142 Monessen, Pa. P7 .137 Pittsburg, Calif. C11 .156 Rankin, Pa. A7 .137 So, Chicago, Ill. R2 .139 Sterling, Ill. (1) N15 .137 Worcester, Mass. A7 .143 NAILS, CUT (100 lb keg) To Dealers (33) Conshohocken, Pa. A3 .\$8.30 Wheeling, W. Va. W10 .8.30 STAPLES, Polished Stock To Dealers & Mfrs. (7) Aliquippa, Pa. J5 .138 Atlanta A11 .140 Bartonville, Ill. K4 .139 Crawfordsville, Ind. M8 .139 Donora, Pa. A7 .138 Duluth, Minn. A7 .138 Fairfield, Ala. T2 .138 Johnstown, Pa. B2 .133 Johnstown, Pa. B2 .133 Johnstown, Pa. B2 .138 Kokomo, Ind. C16 .129 Minnequa, Colo. C10 .142 Monessen, Pa. P7 .137	(F.o.b. plant, per cent off list in packages) Plain finish	98+% Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. shipping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular fragments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) 31.00 Carbonyl Iron: 97.9-99.8% size 5 to 10 microns. \$3.00-148.00	Electrolytic 13.75° Reduced 13.75° Lead 7.50° Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel-Silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 4.40 to 10ts 58.50 Silicon 43.50 Solder 7.00° Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Tin 14.50° Zinc, 5000-lb lots 17.25-31.00† Tungsten Dollars Melting grade, 99% 60 to 200 mesh: 1000 lb and over 4.95 Less than 1000 lb 5.10 Chromlum, electrolytic 99.2% Cr min 3.50
Ibject to zinc equaliza- **I extras. I yEN Fence, 9-151/2 Ga. Col. **City, Ala. R2146 **City, 18 ga. R2241** **City, 18 ga. R2251** **I'ppa,Pa.9-14 ½ga.J5 149\$ **Inta A11151 **tonville,Ill, K4152 **Wfordsville,Ind, M8151 **tora,Pa. A7146† **tth,Minn, A7146† **tth,Minn, A7146† **ston,Tex. S5151† **nstown,Pa. (43) B2149 **et,Ill, A7146 **tomo,Ind. C16148† **tomo,Ind. C16	Minnequa, Colo. C10 .142 Monessen, Pa. P7 .137 Pittsburg, Calif. C11 .156 Rankin, Pa. A7 .137 So, Chicago, Ill. R2 .139 Sterling, Ill. (1) N15 .137 Worcester, Mass. A7 .143 NAILS, CUT (100 lb keg) To Dealers (33) Conshohocken, Pa. A3 .\$8.30 Wheeling, W. Va. W10 .8.30 STAPLES, Polished Stock To Dealers & Mirs. (7) Col. Aliquippa, Pa. J5 .138 Atlanta A11 .140 Bartonville, Ill. K4 .139 Crawfordsville, Ind. M8 .139 Donora, Pa. A7 .138 Duluth, Minn. A7 .138 Fairfield, Ala. T2 .188 Johnstown, Pa. B2 .133 Joilet, Ill. A7 .138 Kokomo, Ind. C16 .139 Minnequa, Colo. C10 .142 Monessen, Pa. P7 .137 Pittsburg, Calif. C11 .157	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. shipping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular fragments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe. 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) 31.00 Carbonyl Iron: 97.9-99.8% size 5 to 10 microns .83.00-148.00 Aluminum: Atomized, 500 lb	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel, silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 4/4-ton lots 58.50 Silicon 43.50 Solder 7.00* Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Th 14.50* Zinc, 5000-lb lots 17.25-31.00; Tungsten Dollars Melting grade, 99% 60 to 200 mesh: 1000 lb 5.10 Chromium, electrolytic 99.2% Cr min 3.50 *Plus cost of metal, †Depending on composition, ‡De-
Ibject to zinc equaliza- **Fextras. VEN Fence, 9-15½ Go. Col. City, Ala. R2	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l. in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular fragments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe, 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) . 31.00 Carbonyl Iron: 97.9-99.8% size 5 to 10 microns .83.00-148.00 Aluminum: Atomized, 500 lb drums, frght. allowed: Carlots 32.20	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel-silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 4.50 4ton lots 58.50 Silicon 43.50 Solder 7.00* Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Tin
**Ibject to zinc equaliza- f extras. VEN Fence, 9-151/2 Ga. Col. City, Ala. R2	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y., c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular fragments of % in. x 1.3 in. 21.00 Annealed, 99.5% Fe. 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) 31.00 Carbonyl Iron: 97.9-99.8% size 5 to 10 microns. 83.00-148.00 Aluminum: Atomized, 500 lb drums, frght, allowed:	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel-silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 4.50 4ton lots 58.50 Silicon 43.50 Solder 7.00* Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Tin
Ibject to zinc equaliza- **Fextras. VEN Fence, 9-151/2 Ga. Col. City, Ala. R2	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l. in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular fragments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe, 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) . 31.00 Carbonyl Iron: 97.9-99.8% size 5 to 10 microns .83.00-148.00 Aluminum: Atomized, 500 lb drums, frght. allowed: Carlots 32.20	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel-silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 4.50 4ton lots 58.50 Silicon 43.50 Solder 7.00* Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Tin
Ibject to zinc equaliza- **rextras. VEN Fence, 9-151/2 Go. Col. City, Ala. R2	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.25 Minus 20 mesh 9.20 Swedish, c.i.f. N.Y. c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. shipping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular fragments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe. 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) 31.00 Carbonyl Iron: 97.9-99.8% size 5 to 10 microns. 83.00-148.00 Aluminum: Atomized, 500 lb drums, frght. allowed: Carlots 32.20 Ton lots 34.20	Electrolytic 13.75* Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel, unannealed 97.00 Nickel-Silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 4-ton lots 58.50 Silicon 43.50 Solder 7.00* Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Tin 14.50* Zinc, 5000-lb lots 17.25-31.00\$ Tungsten Dollars Melting grade, 99% 60 to 200 mesh: 1000 lb 3.10 Chromlum, electrolytic 99.2% Cr min 3.50 *Plus cost of metal. †Depending on mesh. \$70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.
Ibject to zinc equalizar extras. VEN Fence, 9-15½ Go. Col. City, Ala. R2	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98+% Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular fragments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe. 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) 31.00 Carbonyl Iron: 97.9-99.8% size 5 to 10 microns 33.00-148.00 Aluminum: Atomized, 500 lb drums, frght. allowed: Carlots 32.20 Ton lots 34.20 (17) Flats only; 0.25 in, & heavier. (18) To dealers.	Electrolytic 13.75° Reduced 13.75° Lead 7.50° Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel, unannealed 97.00 Nickel-Silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 4-ton lots 58.50 Silicon 43.50 Solder 7.00° Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Tin 14.50° Zinc, 5000-lb lots 17.25-31.00‡ Tungsten Dollars Melting grade, 99% 60 to 200 mesh: 1000 lb and over 4.95 Less than 1000 lb 5.10 Chromium, electrolytic 99.2% Cr min 3.50 *Plus cost of metal, †Depending on composition, ‡Depending on composition, ‡Depending on mesh, \$70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.
Ibject to zinc equalizar extras. VEN Fence, 9-15½ Go. Col. City, Ala. R2	Minnequa, Colo. C10 .142 Monessen, Pa. P7 .137 Pittsburg, Calif. C11 .156 Rankin, Pa. A7 .137 So, Chicago, Ill. R2 .139 Sterling, Ill. (1) N15 .137 Worcester, Mass, A7 .143 NAILS, CUT (100 lb keg) To Dealers (33) Conshohocken, Pa. A3 .\$8.30 Wheeling, W. Va. W10 .8.30 STAPLES, Polished Stock To Dealers & Mfrs. (7) Col. Aliquippa, Pa. J5 .138 Atlanta A11 .140 Bartonville, Ill. K4 .139 Crawfordsville, Ind. M8 .139 Donora, Pa. A7 .138 Juluth, Minn. A7 .138 Fairfield, Ala. T2 .138 Johnstown, Pa. B2 .133 Johnstown, Pa. B2 .137 Pittsburg, Calif. C11 .157 Rankin, Pa. A7 .138 SparrowsPt., Md. B2 .140 Sterling, Ill. (1) N15 .134 Worcester, Mass. A7 .144 Ile Wire, Automotic Baler (14½ Ga. I/Per 97 lb Nel Box) Coi No. 3150 AflabamaCity, Ala. R2 .\$8.77 Donora, Pa. A7 .8.77 Dollet, Ill. A7 .8.77	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular fragments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe. 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) 31.00 Carbonyl Iron: 97.9-99.8% size 5 to 10 microns 83.00-148.00 Aluminum: Atomized, 500 lb drums, frght, allowed: Carlots 32.20 Ton lots 34.20 (17) Flats only; 0.25 in, & heavier. (18) To dealers. (19) Chicago & Pitts, base. (20) 0.25 off for untreated.	Electrolytic 13.75° Reduced 13.75° Lead 7.50° Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel-Silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 44-ton lots 58.50 Silicon 43.50 Solder 7.00° Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Tin
Ibject to zinc equaliza- **Fextras. VEN Fence, 9-151/2 Ga. Col. City, Ala. R2	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular frag- ments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe. 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) 31.00 Carbonyl Iron: 97.9-99.8% size 5 to 10 microns 83.00-148.00 Aluminum: Atomized, 500 tb drums, frght. allowed: Carlots 32.20 Ton lots 32.20 Ton lots 34.20 (17) Flats only; 0.25 in & heavier. (18) To dealers. (19) Chicago & Pitts, base. (20) 0.25 off for untreated. (21) New Haven, Conn., base, (22) Del. San Francisco Bay	Electrolytic 13.75° Reduced 13.75° Lead 7.50° Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel-Silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 4-ton lots 58.50 Silicon 43.50 Solder 7.00° Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Tin 14.50° Zinc, 5000-lb lots 17.25-31.00\$ Tungsten Dollars Melting grade, 99% 60 to 200 mesh: 100 lb 5.10 Chromium, electrolytic 99.2% Cr min 3.50 *Plus cost of metal. †Depending on mesh. \$70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.
Ibject to zinc equalizar extras. VEN Fence, 9-15½ Go. Col. City, Ala. R2	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular frag- ments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) 31.00 Carbonyl Iron: 97.9-99.8% size 5 to 10 microns \$3.00-148.00 Aluminum: Atomized, 500 ib drums, frght, allowed: Carlots 32.20 Ton lots 34.20 (17) Flats only; 0.25 in, & heavier. (18) To dealers. (19) Chicago & Pitts, base. (20) 0.25 off for untreated. (21) New Haven, Conn., base. (22) Del. San Francisco Bay area. (23) 20 Ga, 38" wide.	Electrolytic 13.75° Reduced 13.75° Lead 7.50° Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel, unannealed 97.00 Nickel-Silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 4-ton lots 58.50 Silicon 43.50 Solder 7.00° Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Tin 14.50° Zinc, 5000-lb lots 17.25-31.00‡ Tungsten Dollars Melting grade, 99% 60 to 200 mesh: 100 lb 5.10 Chromium, electrolytic 99.2% Cr min 3.50 *Plus cost of metal. †Depending on composition. ‡Depending on composition. ‡Depending on mesh. \$70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.
Ibject to zinc equalizar extras. VEN Fence, 9-15½ Go. Col. City, Ala. R2	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.20 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular frag- ments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe. 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) 31.00 Carbonyl Iron: 97.9-99.8% size 5 to 10 microns 83.00-148.00 Aluminum: Atomized, 500 tb drums, frght. allowed: Carlots 32.20 Ton lots 32.20 Ton lots 34.20 (17) Flats only; 0.25 in, & heavier. (18) To dealers. (19) Chicago & Pitts, base. (20) 0.25 off for untreated. (21) New Haven, Conn., base, (22) Del. San Francisco Bay area. (23) 20 Ga, 36" wide. (25) Bar mill bands.	Electrolytic 13.75° Reduced 13.75° Lead 7.50° Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Silicon 43.50 Sil
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Ribject to zinc equalizar extras. VEN Fence, 9-15½ Go. Col. City, Ala. R2	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.20 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular fragments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe. 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) . 31.00 Carbonyl Iron: 97.9-99.8% size 5 to 10 microns 83.00-148.00 Aluminum: Atomized, 500 lb drums, frght, allowed: Carlots 32.20 Ton lots 32.20 Ton lots 32.20 Ton lots 34.20 (17) Flats only; 0.25 in, & heavier. (18) To dealers. (19) Chicago & Pitts, base. (20) 0.25 off for untreated. (21) New Haven, Conn., base, area,	Electrolytic 13.75° Reduced 13.75° Lead 7.50° Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel, unannealed 97.00 Nickel, unannealed 97.00 Nickel, unannealed 97.00 Silicon 43.50 Stainless Steel, 302 94.00 Stainless Steel, 302
Ibject to zinc equaliza- **Fextras. VEN Fence, 9-15½ Go. Col. City, Ala. R2	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular fragments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe. 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) . 31.00 Carbonyl Iron: 97.9-99.8% size 5 to 10 microns .83.00-148.00 Aluminum: Atomized, 500 lb drums, frght, allowed: Carlots 32.20 Ton lots 32.20 Ton lots 34.20 (17) Flats only; 0.25 in, & heavier. (18) To dealers. (19) Chicago & Pitts, base. (20) 0.25 off for untreated. (21) New Haven, Conn., base, 220 Col. San Francisco Bay airea, 23.20 Area, 23.20 Shar mill bands. (26) Reinforcing mill lengths, to fabricators; to consumers, 4,95c. (27) Bar mill sizes. (28) Bonderized. (29) Youngstown base. (20) Sheraid; for universal mill	Electrolytic 13.75° Reduced 13.75° Lead 7.50° Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Silicon 43.50 Solder 7.00° Stainless Steel, 36 \$1.25 Tin 14.50° Zinc, 5000-lb lots 17.25-31.00 Tungsten Dollars Melting grade, 99% 60 to 200 mesh: 1000 lb and over. 4.95 Less than 1000 lb 5.10 Chromium, electrolytic 99.2% Cr min. 3.50 *Plus cost of metal, †Depending on composition. ‡Depending on composition. ‡Depending on mesh. \$70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni. (31) Widths over %-in.; 6.40° for widths %-in. and under by 0.125 in. and thinner. (32) Buffalo base. (33) To jobbers, deduct 20c. (34) 9.60c for cut lengths. (35) 72° and narrower. (36) 54" and narrower. (37) 13 Ga. & heavier; 60" & narrower. (38) 14 Ga. & lighter; 48" & narrower. (39) 48" and narrower. (39) 48" and narrower. (39) 48" and narrower. (40) Lighter than 0.035"; 0.085" and heavier, 0.256 higher. (41) 9.10c for cut lengths. (42) Mill lengths, f.o.b. mill; deld, to mill 2 one or within
### ### ### ### ### ### ### ### ### ##	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh	Electrolytic 13.75° Reduced 13.75° Lead 7.50° Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Silicon 43.50 Silicon 43.50 Solder 7.00° Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Tin 14.50° Zinc, 5000-lb lots 17.25-31.00\$ Tungsten Dollars Melting grade, 99% 60 to 200 mesh: 1000 lb 5.10 Chromium, electrolytic 99.2% Cr min 3.50 *Plus cost of metal, ppending on composition. ‡Depending on composition. ‡Depending on mesh. \$70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni. (31) Widths over %-in.; 6.40° for widths %-in. and under by 0.125 in. and thinner. (32) Buffalo base. (33) To jobbers, deduct 20c. (34) 9.60° for cut lengths. (35) 72° and narrower. (36) 54° and narrower. (37) 13 Ga. & heavier; 60° & narrower. (38) 14 Ga. & lighter; 48″ & narrower. (39) 48° and narrower. (40) Lighter than 0.035°; 0.085° and heavier, 0.250 higher. (41) 9.10c for cut lengths. (42) Mill lengths, f.o.b. mill; deld, to mill 20ne or within switching limits, 5.10c.
abject to zinc equaliza- f extras. VEN Fence, 9-151/2 GG. Col. City, Ala. R2	Minnequa, Colo. C10	(F.o.b. plant, per cent off list in packages) Plain finish	98 + % Fe, annealed 15.25 Unannealed: Minus 100 mesh 11.75 Minus 35 mesh 9.25 Minus 20 mesh 9.25 Minus 20 mesh 9.00 Swedish, c.i.f. N.Y. c.l., in bags 11.25 Domestic (Swedish), f.o.b. Riverton, N. J., in bags 9.50 Canadian, f.o.b. ship- ping point 9.50 Electrolytic iron: Melting stock, 99.91% Fe, irregular fragments of ½ in. x 1.3 in 21.00 Annealed, 99.5% Fe. 36.50 Unannealed (99+% Fe) 32.50 Unannealed (99+% Fe) (minus 325 mesh) 52.00 Powder Flakes (minus 16, plus 100 mesh) . 31.00 Carbonyl Iron: 97.9-99.8% size 5 to 10 microns .83.00-148.00 Aluminum: Atomized, 500 lb drums, frght, allowed: Carlots 32.20 Ton lots 32.20 Ton lots 34.20 (17) Flats only; 0.25 in, & heavier. (18) To dealers. (19) Chicago & Pitts, base. (20) 0.25 off for untreated. (21) New Haven, Conn., base, 220 Col. San Francisco Bay airea, 23.20 Area, 23.20 Shar mill bands. (26) Reinforcing mill lengths, to fabricators; to consumers, 4,95c. (27) Bar mill sizes. (28) Bonderized. (29) Youngstown base. (20) Sheraid; for universal mill	Electrolytic 13.75 Reduced 13.75* Lead 7.50* Manganese: Minus 35 mesh 61.00 Minus 100 mesh 67.00 Minus 200 mesh 72.00 Nickel, unannealed 97.00 Nickel, unannealed 97.00 Nickel, unannealed 97.00 Nickel-Silver, 5000-lb lots 47.50-51.00 Phosphor-Bronze, 4-ton lots 58.50 Silicon 43.50 Solder 7.00* Stainless Steel, 302 94.00 Stainless Steel, 316 \$1.25 Tin 14.50* Zinc, 5000-lb lots 17.25-31.00\$ Tungsten Dollars Melting grade, 99% 60 to 200 mesh: 1000 lb 5.10 Chromium, electrolytic 99.2% Cr min 3.50 *Plus cost of metal. †Depending on composition. ‡Depending on mesh. \$70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni. (31) Widths over 56-in.; 6.40* for widths 56-in, and under by 0.125 in, and thinner. (32) Buffalo base. (33) T2" and narrower. (34) 9.60e for cut lengths. (35) 72" and narrower. (36) 54" and narrower. (37) 13 Ga. & heavier; 60" & narrower. (38) 48" and narrower. (39) 48" and narrower. (41) 9.10e for cut lengths. (41) 9.10e for cut lengths. (42) Mill lengths, f.0b, mill; deld. to mill zone or within switching limits, 5.10c.

SEAMLESS STANDARD P	IPE Throaded a	nd Coupled C	arload disco	ounts from li	st, %		
Sizes—Inches	2 37c 58	2½ .5c 7	3 6.5c 7.62	3½ 923 9.20	\$1.09 10.89	5 \$1.48 14.81 Blk Galv*	6 \$1.92 19.15 Bik Galy*
Aliquippa, Pa. J5 13.5 Ambridge, Pa. N2 13.5 Lorain, O. N3 13.5 Youngstown Y1 13.5	17.5 + 3 17.5	Galv* Blk + 0.25 20 20 + 0.25 20 + 0.25 20	Galv* 2.25 2.25 2.25	Blk Galv 21.5 3.7 21.5 21.5 3.7 21.5 3.7	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	20.75 3 20.75 20.75 3 20.75 3	23.25 5 5 23.25 5.5 23.25 5.5 23.25 5.5
ELECTRIC WELD STAND. Youngstown R2 13.5		aded and Coup + 0.25 20	pled Carlo 2.25	ad discounts	from list, % 75 21.5 3.75	20.75 3	23.25 55
	⅓ 5.5c	1/4 6c	arload disco % 6c 0.57	ounts from li- 1/2 8.5c 0.35	st, % 11.5c 1.13	1 17c 1.68	1¼ 23c 2.2×
Pounds Per Ft		Galv* Blk +10.25 7.25	Galv* + 17.25	Blk Galv 23.75 6.5 21.75 4.5 23.75 6.5		Blk Galv* 29.25 14 27.25 12 29.25 14	Blk Gal 31.75 15 29.75 13. 31.75 15. 4
Butler, Pa. F6	+ 3.5 17	+ 8.5 9.5 	+ 15	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccc} 26.75 & 10.5 \\ 24.75 & 8.5 \\ 13.75 & +2.5 \\ 25.75 & 9.5 \\ 26.75 & 10.5 \end{array}$	29,25 14 27,25 12 16,25 1 28,25 13 29,25 14	31.75 15.% 29.75 13. 18.75 2.2 30.75 14. 31.75 15.4
Lorain, O. N3 Sharon, Pa. S4 25 Sharon, Pa. M6 Sparrows Pt., Md. B2 23 Youngstown R2, Y1 Wheatland, Pa. W9 23	+ 3.5 17 + 5.5 15 + 5.5 15	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	+ 15 + 17 + 17	23.75 6.5 21.75 4.5 23.75 6.5 23.75 6.5	26.75 10.5 24.75 8.5 26.75 10.5 26.75 10.5	29.25 14 27.25 12 29.25 14 29.25 14	31.75 15.2. 29.75 13.2: 31.75 15.2: 31.75 15.2:
Size—Inches List Per Ft Pounds Per Ft	1½ 27.5c 2.73	2 37c 3.68	58.	2½ 5c .8 2	3 76.5e 7.62	3 ½ 92c 9.20	81.09 10.89
Aliquippa, Pa. J5 Alton, Ill. L1 Benwood, W. Va. W10. Etna, Pa. N2 Fairless Hills, Pa. N3 Fontana, Calif. K1 Ind. Harbor, Ind. Y1 Lorain, O. N3 Sharon, Pa. M6 Sparrows Pt., Md. B2 Youngstown R2, Y1 Wheatland, Pa. W9 *Galvanized pipe discounts by	Blk 6alv* 32.25 16.25 30.25 14.25 32.25 16.25 32.25 16.25 30.25 14.25 19.25 3.25 31.25 15.25 32.25 16.25 32.25 16.25 32.25 16.25 32.25 16.25 32.25 16.25 32.25 16.25 32.25 16.25	Blk Galv* 32,75 16,75 30,75 14,75 32,75 16,75 32,75 14,75 30,75 14,75 19,75 3,75 31,75 15,75 32,75 16,75 32,75 16,75 32,75 14,75 32,75 16,75 32,75 16,75 32,75 16,75 32,75 16,75	Blk 34, 25 32, 25 34, 25 32, 25 33, 25 34, 25 34, 25 34, 25 34, 25 34, 25 34, 25 34, 25	Galv* 17 15 17 17 17 17 17 15 4 16 17 17 17	Blk Galv* 34.25 17 32.25 17 34.25 17 34.25 17 32.25 15 21.25 4 33.25 16 34.25 17 32.25 17 34.25 17 32.25 17 32.25 17 32.25 17 32.25 17 32.25 17	Blk Galv* 25.5 7.75 25.5 7.75 23.5 5.75 12.5 +5.25 24.5 6.75 23.5 5.75 25.5 7.75 25.5 7.75	Blk Galv

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301 302 302B 303 304	16.75 17.75 19.00	21.00 23.25 25.00 25.25 24.50	30.00 30.25 31.00 32.75 31.75	34.75 35.00 35.00 57.75 36.75	30.25 32.50 35.50 35.00	35.75 36.00 36.00 38.75 38.00	37.75 38.00 38.00 40.25 40.50	41.75 42.00 45.25 46.00 44.50	38.75 42.00 45.25 46.00 44.50
304L 305 308 309	20.50 20.75 27.75	26.50 27.25 36.00	36.75 33.50 36.25 44.00	41.75 37.25 41.75 50.50	40.00 38.00 39.00 50.50	43.00 38.00 43.00 51.75	45.50 41.00 47.00 55.00	49.50 47.50 49.00 63.25	49.50 47.50 49.00 63.25
309S 310 314	29.75 35.00 29.75	38.75 45.25 38.00	48.00 58.75 48.25	55.75 68.25 56.25	55.25 64.75 55.00	56.75 69.50 57.25	$\begin{array}{c} 60.25 \\ 71.00 \\ 71.00 \\ 60.50 \end{array}$	69.75 74.25 64.50	69.75 74.25 64.50
316L 317 321 330	35.00 23.50	45.50 30.25	53.25 59.25 36.00 61.50	61.25 68.75 41.50	60.00 69.50 41.75	$62.25 \\ 70.25 \\ 42.75 \\ 72.00$	65.50 72.75 46.50 73.25	69.50 79.00 51.25 81.25	69.50 79.00 51.25 81.25
18-8CbTa 403 405 410	29.25 16.50 14.00	38.25 21.75 18.25	46.00 27.00 25.25 24.00	52.25 30.75 29.25 27.25	53.00 30.50 26.25	53.75 32.00 30.25 28.75	58.50 34.25 31.75 30.00	39.75 34.25	66.50 39.75 34.25
414 416 420	22.00 14.25	28.50 18.50	24.50 24.50 29.25 24.50	28.25 34.00 28.25	35.50 27.00	29.25 29.25 35.00 29.25	30.50 38.50 30.50	35.25 52.75 34.75	35.25 52.75 34.75
430F 431	15.00	19.25	25.00 25.00 33.50	28.75 28.75 38.25	28.00 50,25	29.75 29.75 39.50	31.00 40.75	35.75 59.75	35,75 59,75

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America, Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Inc.; Josyln Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pitts-burgh Rolling Mills Inc.; Republic Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co.; Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; True Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Pla	tes	Sheets
	Carbo	n Base	Carbon Bas
	10%	20%	20%
Stainless:			
302			28.00
304	28.30	33.60	29.75
304-L	30.30	35.50	
310	41.30	47.00	
316	33.40	38.80	42.75
316-L	37.80	43.30	
316-CB	38.90	45.50	
321	30.00	35.30	34.25
347	32,20	38.60	44.25
405	23.90	31.10	
410	23.40	30.60	
430	23,40	30.60	24.25
Inconel	47.90	63.90	
Nickel	39.50	54.10	
Monel	40.80	54.80	
L-Nickel	41.70	58.50	
Copper*	41.10	90,00	46.00
Copper			
			arbon Base-
			Rolled-
		10%	Both Sid
Copper*		26.60	33.00
*Deoxidized,	Production p	oints: Stainle	ss-clad sheet

*Deoxidized. Production points: Stainless-clad sheet New Castle, Ind I-4; stainless-clad plates, Claymont, Di C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Wasington, Pa. J3; nickel, inconel, monel-clad plates, Coateville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

3.5

9

- 1									
	Extra (r Carbon Carbon Carbon .	. 0.31	.26 315 .37	Grade 5% Cr H W-Cr Hot V-Cr Hot Hi-Carbon	ot Work Work Work	rk k k	<i>.</i>	0.42
ı		Grade by	Analysis	(%)					
ı	W	Cr	V	Co	Mo			\$	per
	20.25	4.25	1.6	12.25	4.4.4				4.03
	18.25	4.25	1	4.75			2.	245	-2.4.
	18	4	2	9					2.6
	18	4	2	U					1.70
	18	4	7						
		4	1					2 4	1.5
	14	4	2	5					2.13
•	13.75	3.75	2	5					2.13

dollars per gross ton, as reported to Steel. Minimum delivered prices are approximate and do not include 3% federal tax.

Fortransking District		No. 2	Malle-	Besse-	
ningham District	Basic	Foundry	able	mer	
bamaCity, Ala. R2	52.38	52.88			
ningham R2	52.38	52.88			1
ningham U6sden.Ala, R2		52.88	56.50†		
sden, Ala. R2	52.38	52.88			
memmati, deld		60.58			
falo District					
falo H1, R2	56.00	56.50	57.00	57.50]
awanda, N. Y. W12	56.00	56.50	57.00]
Tonawanda, N.Y. T9		56.50	57.00	57.50]
oston, deld	66.65	67.15	67.65		3
ochester, N.Y., deld.	59.02	59.52	60.02		,
yracuse, N.Y., deld.	60.12	60.62	61.12		
arago District					1
cago I-3	56.00	56.50	56.50	57.00	ĵ
cago R2	56.00		56.50		r
y,Ind. U5	56.00	,	56.50		
anaHarbor, Ind. I-2	56.00		56.50		-
Chicago, Ill. W14, Y1	56.00	56.50	56.50		
Chicago, Ill. U5	56.00	E0.07	56.50	57.00	
uskegon, Mich., deld.	58.17	58.67 62.80	58.67	59.17	
		02.80	62.80		2
eland District					
reland A7, R2	56.00	56.50	56.50	57.00	
kron,O., deld	58.75	59.25	59.25	59.75	.]
ain,O. N3	56.00			57.00	1
!'-Atlantic District					7
hlehem,Pa. B2	58.00	58.50	59.00	59.50	4
ewYork, deld,		62.28	62.78		
ewark, deld	61.02	61.52	62.02	62.52	
isboro,Pa. B10	58.00	58.50			
ester, Pa. C31		48.50	49.00		
hiladelphia, deld.	50.00	50.16	50.66		7
edeland, Pa. A3	58.00	58.50	59.00	59.50	J
'hiladelphia, deld	58.00 59.66	58.50 60.16	59.00 60.66	59.50	1
y,N.Y. R2	58.00	58.50	59.00	61.16 59.50	
	30.00	. 00190	30,00	50.00	
tsburgh District					
illeIsland,Pa. P6	56.00	56.50	56.50	57.00	7
rittsburgh (N&S sides),		FF 07	FE 05	EC 05	T
Aliquippa, deld		57.87 57.54	57.87	58.37	Î
awrenceville, Homestead,		≥ 01.04	57.54	58.04	
Wilmerding, Monaca, deld		58.16	58.16	58.66	l l
Terona, Trafford, deld.	58.19	58.69	58.69	59.19	-
3rackenridge, deld	58.45	58.95	58.95	59.45	I
semer,Pa. U5	56.00	,-6	56.50	57.00	F
irton, Rankin, So. Duquesne, Pa. U5					S
Keesport,Pa. N3	56.00			57.00	
dland,Pa. C18	56.00				1

Youngstown District	Basic	No. 2 Foundry	Malle- able	Besse- mer
Hubbard, O. Y1			56.50	
Sharpsville, Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1		00.00	56.50	57.00
Youngstown U5	56.00			57.00
Mansfield, O., deld	60.90		61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie, Pa. I-3	56.00	56.50	56.50	57.00
Everett, Mass. E1	60.50	61.00	61.50	
Fontana, Calif. K1	62.00	62.50		
Geneva, Utah C11	56.00	56,50		
GraniteCity,Ill. G4	57.90	58.40	58.90	
Ironton, Utah C11	56.00	56.50		
LoneStar, Texas L6	52.00	52.50*	52.50	
Minnequa, Colo. C10	58.00	59.00	59.00	
Rockwood, Tenn, T2		52.50*	56.50	
Toledo, O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld	61.76	62.26		

^{*}Low phos, southern grade. †Phos, 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on iow phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over. Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra: 0.50-0.74% inclusive add 50 per ton ton the content of the co

of portion thereon. Ticket! Under 0.50% no extra; 0.50-0.74%, inclusive, add \$2 per ton and each additional 0.25%, add \$1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add \$1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1
Buffalo H1

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add \$1 for each 0.50 Si to 18%; \$1 for each 0.50% Mn over 1%; \$2 per gross ton premium for 0.045% max P)

 NiagaraFalls, N.Y.
 P15
 \$80.50

 Keokuk, Iowa,
 (Open-hearth & Fdry, freight allowed K2)
 85.00

 Keokuk, O.H.
 & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2
 88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland A7 (Intermediate)	\$61.00
Lyles, Tenn. T3	70.00
Rockwood, Tenn. T3	70.00
Steelton, Pa. B2	
Philadelphia, deld	67.55
Troy, N.Y. R2	64.00

Varehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Buffalo, 25 cents; Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston and Los Angeles, 10 cents; Houston, Seattle, Spokane, Wash., no charge.

	SHEETS							-BARS-		Standard		
	Hot	Cold	Gal.	Stainless	STRIP				H.R. Alloy 4140††5	Structural		TES
	Rolled	Rolled	10 Ga.t	0 Ga.t Type 302‡‡		H.R.* C.R.*		H.R. Rds. C.F. Rds.‡		Shapes	Carbon	Floor
ltimore	6.02	7.51	7.79		6.69		6.68	8.026	12.54	6.72	6.37	7.76
mingham	6.35	7.35	8.25^{2}		6.60		6.50	9.10		6.65	6.65	8.45
ston	7.23	8.23	9.57	45.289	7.47		7.20	8.60	12.30	7.49	7.37	8.50
ffalo	6.35	7.40	8.84		6.70		6.50	7.40	12.00	6.72	6.65	7.90
arlotte, N. C.	6.95	7.80	8.69		6.90		7.10	8.37		7.10	7.10	8.37
icago	6.38	7.38	8.30	46.05	6.62		6.51	7.25	11.75	6.69	6.52	7.64
.ucinnati	6.49	7.37	8.30	46.10	6.86		6.75	7.55	12.00	6.86	6.81	7.89
eveland	6.38	7.38	8.25	46.16	6.72		6.57	7.35	11.81	7.02	6.69	7.81
troit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.54	11.95	7.16	6.80	7.83
ie, Pa	6.35	7.38	8.30		6.70		6.50	7.45^{4}		6.69	6.52	7.64
uston	7.35	7.80	9.99		7.70	9.30	7.70	9.30		7.60	7.35	8.75
s Angeles	7.50	9.35	9.95	50.15	7.85	11.75	7.45	10.15	13.15	7.65	7.45	9.55
lwaukee	6.47	7.47	8.39		6.71		6.60	7.44	11.84	6.86	6.61	7.73
oline, Ill	6.73	7.73	8.65		6.97		6.86	7.60		7.04	6.87	
w York	6.97	7.91	8.79	44.95	7.56		7.37	8.736	12.13	7.38	7.27	8.68
orfolk, Va	7.00				7.10		7.10	8.60		7.10	7.10	7.95
iladelphia	6.19	7.44	8.26	41.989	6.96	8.80	6.74	7.868	11.96	6.54	6.49	7.51**
ittsburgh	6.38	7.38	8.30	46.00	6.72		6.51	7.35	11.75	6,69	6.52	7.64
rtland, Oreg	7.00	7.75	9.10	48.50	7.25		7.05	10.20	14.00	7.00	6.85	8.75
chmond, Va	6.43	7.39	8.67		6.77		6.71	8.33		7.08	6.65	8.08
. Louis	6.67	7.67	8.59	43.89	6.91		6.80	7.648	12.04	7.09	6.81	7.93
. Paul	7.04	8.04	8.96		7.28		7.17	8.01		7.35	7.18	8.30
un Francisco	7.55	8.95	9.45	51.65	7.80		7.35	10.05	13.05	7.50	7.40	9,45
attle	8.10	9.80	10.15	51.00	8.20		7.80	10.95	13.50	7.75	7.80	9.60
mkane	8.35	9.65^{7}	10.15		7.80		7.80	10.85§§	14.25	7.45	7.55	9.60
ashington	6.70	7.99	7.97		7.37		7.38	9.09		7.31	7.05	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11.50-cent zinc except in Birmingham (coating extra exuded); ‡includes 35-cent special bar quality extras; **1%-in. and heavier; ††as annealed; ‡‡prices include \$2 for crating; §§under 1½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars. 2000 lb and over except in Seattle, 2000 to 9999 lb; ainlss sheets, 8000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; \$\int_{-00}\$ to 9999 lb; \$\int_{-00}\$ to 9999 lb; \$\int_{-00}\$ to 3999 lb; \$\int_{-00}\$ to 3999 lb; \$\int_{-00}\$ to 3999 lb; \$\int_{-00}\$ to 3999 lb; \$\int_{-000}\$ lb and over; \$\int_{-000}\$ lb and over.

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SPEED REPLACEMENT! CUT COSTS! REDUCE INVENTORY!

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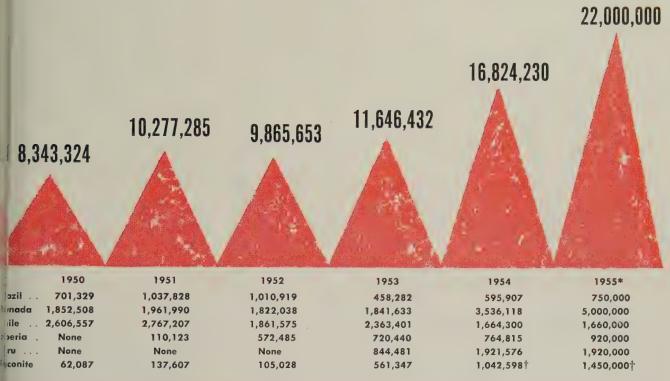


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Total Iron Ore Imports and Taconite Shipments

(gross tons)



stimated by STEEL. †Includes jasper.

curces: Lake Superior Iron Ore Association; U. S. Bureau of Mines.

Steelmakers Buy More Insurance for Furnaces

OMESTIC STEEL PRODUCERS re buying more imported ore and aconite this year than ever before.

As the higher-grade ores of the take Superior region show signs of etering out and as U. S. steelmaking apacity expands, it becomes obvious hat some outside sources of blast-urnace ore must be developed. The able above shows what progress has

Some Will Gain—Three sources oom as the most important in the oreseeable future: Venezuela, Canda and taconite from the Lake Superior region. High-grade Venezuelan ores should develop more rapidly over the next five years than the other sources because of the direct water shipping lanes from mines to producers. At the end of that time, the St. Lawrence Seaway will be in operation, and shipments of Labrador ores to the steelmaking centers of the Midwest will show a sharp rise.

Taconite will develop spectacularly of present plans materialize. Shipments this year will be only about 1.5 million gross tons, but by 1957,

they should be close to 10 million tons and about 30 million tons by 1970. That's nearly half as much as the whole Lake Superior region shipped in 1954. It has been estimated that there are at least 5 billion gross tons of taconite ore in that area, which would yield about 1.5 billion tons of concentrate.

Others Will Drop Out—Of the other major sources listed above, Liberia is the most important, even though tonnage now is not so great as that from Peru and Chile. This rich African ore still is in the early stages of development, and imports have been climbing steadily. Peruvian and Chilean ores are declining in importance to domestic steelmakers as Venezuelan shipments increase. It is anticipated that by 1957 the U. S. will be importing little, if any, of the former.

In addition to the sources listed above, about a dozen others will supply a total of nearly 2.5 million tons of ore this year. Most of it, a highgrade ore that goes into specialty steels, will come from Sweden. A new source is Bethlehem Steel Co.'s bene-

ficiation plant at Marmora in eastern Ontario. First shipment from there went out last week to Bethlehem's Lackawanna, N. Y., works. Production is expected to reach 250,-000 tons this year, with a rated capacity of about 500,000 gross tons.

Mesabi Still Kicking—The bulk of the ore for U. S. blast furnaces will continue to come from the Mesabi range and the other great deposits of the Lake Superior region. Best guesces place reserves of commercial quality at about 1.5 billion tons, and exploration is going on continuously to raise that figure. But steelmakers aren't taking any chances and will continue to invest in other sources.

Iron Ore . . .

Iron Ore Prices, Page 167

Iron ore is moving down the Great Lakes in near-record volume. In the week ended May 9, the fleet hauled 2,336,455 gross tons, reports the Lake Superior Iron Ore Association. This brought the season's total to 6,452,-826 tons, nearly double that in the like period of 1954 and only a little more than 2 million tens under the record-shipment pace set in 1953. Total movement in that season topped 96 million gross tons.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 155 & 156

The way things are shaping up, tight sheet supply will be experienced pretty much through remainder of this year. While tonnage still can be had for August shipment, mill order books are rapidly filling for the third quarter—in fact, some producers could be sold out for the period were they disposed to accept all the business offered.

Meanwhile, consuming demand for all types of sheets continues upward. Despite the tight supply and strong demand, however, there is no evidence of gray market activity.

Midwest sheetmakers say the auto builders would increase their intake of cold-rolled sheets during June, July and August were it possible. Automotive ordering for the third quarter appears to be following the pattern set in the second three months of the year. All district sheet mill order books are filling for the third quarter, one Chicago area producer reporting business offered it exceeds by 25 to 50 per cent its ability to accommodate.

Hot and cold-rolled carbon sheets can still be had in the East for delivery in August where buyers have regular sources of supply and their requirements conform with the pattern of past purchases.

Even so, the mills will enter third quarter with substantial shipment arrearages. It is doubtful if any galvanized sheets, especially the continuous hot-dipped grade, can be had before September, except for occasional spot openings which may result from order cancellations.

A large Pittsburgh district strip mill which usually closes for vacation, this year plans to continue operations as close to capacity as possible.

During March, sheet and strip shipments totaled 2,781,757 net tons, 38.3 per cent of the over-all steel mill tonnage. This compares with 31 per cent in March a year ago. The first quarter total was 7,757,676 tons, or 40 per cent of over-all shipments. In the first quarter last year it was 32.9 per cent.

Sheets and strip were the largest tonnage groups in March, reflecting, to considerable extent, the high level of activity in the auto industry, the largest consumer of steel during the month. The auto steel take at 1,679,200 tons set a new monthly high for the industry, the previous peak being in January, when it took 1.559,774 tons.

Pia Iron . . .

Pig Iron Prices, Page 159

While far from brisk, pig iron demand is creeping upward. One leading producer reports shipments have gained the last two months and is confident they will increase more this month. Volume in June will decline as a prelude to plant shutdowns for vacations.

Buying of merchant foundry iron is exceeding consumption, with buyers apparently covering more actively in anticipation of higher prices this summer. At the time of the general increase in steel prices last summer, following steel wage increases,

there was no advance in pig iron prices. This year there is growing belief among consumers that pig iron prices will be hiked.

In the Midwest, foundries are stepping up their melting activities moderately to keep pace with a gain in orders for castings. Contrary to earlier expectations, automotive foundries are maintaining their schedules at a high level. Gray iron foundry operations in the New York metropolitan area are estimated at between 70 and 75 per cent of normal.

Republic Steel Corp. has all its southern blast furnaces in operation. Its No. 2 blast furnace at Gadsden. Ala., was lighted last week.

Steel Output Sets Record

Steel production of 9,806,000 net tons in April was the highest for that month in any year, reports the American Iron & Steel Institute. The previous record was set in 1953 when production totaled 9545,538 tons. Output a year ago was 6,970,937 tons.

Last month's production was 94.7 per cent, compared with 93.4 per cent in March. The total tonnage for March, a longer month, was higher at 9,981,754 net tons. Output for the first four months this year was at a rate of 89.7 per cent of capacity.

Record shipments of steel to the automotive industry in March helped raise total finished steel shipments for that month to the second highest figure ever attained. The March total was 7,268,795 net tons, exceeded only by the 7,436,919 tons shipped in March, 1953.

Comparative production data are given in the accompanying table.

		HEART Per cent of capacity		B	ESSEMER Per cent of capacity	•	——E	LECTRIC Per cent of capacity			Per cent of capacity		Calculated weekly production (Net tons)	Number of weeks in month
	4,345	86.0	125.7	199,229	49.0	56.7	584,162	63.6	163.6	8,837,736	82.7	124.2	1,994,974	4.43
*March 9,060 *1st Quarter 24,849	0,026		133.7 141.4 133.6	197,091 255,493 651,813	53.7 62.8 55.2	62.1 72,7 63.9	564,959 666,235 1,815,356	68.1 72.6 68.1	175.1 186.5 175.1	8,496,934 9,981,754 27,316,424	88.0 93.4 88.0	132.2 140.3 132.3	2,124,233 2,253,281 2,124,139	4.00 4.43 12.86
†April 8,856 1954 January 7.256	6,000 6. 526	97.6 78.3	142.9 113.3	275,000 260,453	69.8 64.0	80.9 74.1	675,000	75.9	195.3	9,806,000	94.7	142.4	2,286,000	4.29 4.43
February 6,523 March 6,649	3,213 9,667	77.9 71.7	112.8 103.8	174,253 207,726	47.4 51.1	54.9 59.1	434,507 385,771 432,207	48.9 48.1 48.7	121.7 119.6 121.0	7,951,486 7,083,237 7,289,600	75.3 74.3 69.0	111.8 110.2 102.5	1,794,918 1,770,809 1,645,508	4.00 4.43
1st Quarter 20,428 April 6,368 May 6,817	5,326 7,951	75.9 70.9 73.6	109.9 102.7 106.4	642,432 162,657 198,063	54.4 41.3 48.7	63.0 47.8 56.4	1,252,485 442,954 456,724	48.6 51.5 51.4	120.8 128.2 127.9	22,324,323 6,970,937 7,472,738	72.8 68.1 70.7	108.1 101.3 105.0	1,735,950 1,624,927 1,686,848	12.86 4.29 4.43
June 6,702 2nd Quarter 19,885 1st Half 40.314	5,283	74.7 73.1 74.5	108.1 105.8 107.8	207,666 568,386 1,210,818	52.7 47.6 51.0	61.1 55.1 59.0	453,962 1,353,640 2,606,125	52.8 51.9 50.3	131.3 129.1 125.0	7,363,634 21,807,309 44,131,632	72.0 70.3 71.5	107.0 104.4 106.2	1,716,465 1,676,196 1,705,900	4.29 13.01 25.87
July 6,040 August 6,021 September 6,140	0,120 1,496	65.3 65.0 68.6	94.3 94.0 99.1	205,313 217,837	50.6 53.6	58.4 62.0	382,164 427,574	43.1 48.2	107.0 119.7	6,627,597 6,666,907	62.9 63.1	93.2 93.7	1,499,456 1,504,945	4.42
3rd Quarter 18,201 9th Month 58,516	1,882 6,571	66.3 71.7	95.8 103.7	214,065 637,215 1,848,033	54.5 52.9 51.6	63.0 61.1 59.7	453,152 1,262,890 3,869,015	52.8 48.0 49.5	131.1 119.1 123.0	6,807,483 20,101,987 64,233,619	66.7 64.2 69.1	98.9 95.2 102.5	1,590,533 1,530,997 1,647,016	4.28 13.13 39.00
October 6,973 November 7,307 December 7,530	7,151	75.2 81.4 81.4	108.9 117.9 117.6	237,754 231,191 231,126	58.5 58.7 57.0	67.7 68.0 65.8	490,211 551,085 525,743	55.2 64.1 59.4	137.3 159.4 147.2	7,701,533 8,089,427 8,287,073	72.9 79.1 78.6	108.3 117.5 116.5	1,738,495 1,885,647	4.43 4.29 4.42
4th Quarter 21,810 2nd Half 40,012 Total 80,327	2,805	79.3 72.8 73.6	114.7 105.2 106.5	700,071 1,337,286 2,548,104	58.0 55.4 53.2	67.1 64.1 61.6	1,567,039 2,829,929 5,436,054	59.5 53.8 52.0	147.8 133.5 129.3	24,078,033 44,180,020 88,311,652	76.8 70.5 71.0	114.0 104.6 105.4	1,874,903 1,832,423 1,681,767 1,693,741	13.14 26.27 52.14

Note—The percentages of capacity operated are calculated on weekly capacities in 1955 of 2,114,196 net tons hearth, 91,810 net tons bessement and 207,272 net tons electric ingots and steel for castings, total 2,413,278 net tons; based on annual capacities as of Jan. 1, 1955, as follows: Open hearth 110,234,160 net tons, bessemer 4,787,000 net tons, electric 10,807,150 net tons, total 125,828,310 net tons.

Note—The percentages of capacity operated are calculated on weekly capacities in 1954 of 2,092,342 net tons open hearth, 91,810 net tons bessemes and 200,397 net tons electric ingots and steel for castings, total 2,384,549 net tons; based on annual capacities as of Jan. 1, 1954, as follows: Open hearth 109,094,730 net tons, bessemer 4,787,000 net tons, electric 10,448,680 net tons, total 124,330,410 net tons.

*Revised. †Preliminary figures, subject to revision. \$Index of production based on average weekly production of the three years 1947-1948-1949.

n Plate . . .

Tin Plate Prices, Page 156

refounds town Sheet & Tube Co. will tall new tin mill facilities at its diliana Harbor (Ind.) Works which will virtually double its electrolytic fining capacity.

The rush is on to provide canmaken enough tin plate in advance of canning season. Tin mills expect operate at capacity through restinder of this quarter. Demand will attinue strong into the third quarter.

J. S. Steel Corp., Pittsburgh, has used a revised extra card on black te, effective May 10. Except for addition to the quality differents of a chemically treated extra \$0.70, the card is unchanged from one it supersedes. It was dated ft. 1, 1954.

teel Bars . . .

Bar Prices, Page 154

Barmakers are looking to the third farter with growing confidence that mand will continue strong through the period. They are booking orders a August and September shipment, though some slow-moving sizes can all be obtained for June shipment. The obtained for June shipment is the third quarter.

Two months ago many bar producs were concerned about July and ugust prospects. Now, their doubts we faded, though some slackening sales next quarter is anticipated. general, the outlook for strong mand into the fourth quarter is id to be promising.

Buyers of hot-rolled carbon bars the East are buying more active. This is being reflected in mounting mill order backlogs. Some producers have little tonnage to offer efore August. Cold drawers are becifying freely. Like other conumers, they are not getting as much bring as they want—at least not o quickly as they desire it. Fasteners manufacturers are ordering brisk-

Relatively little tonnage is open 1 July mill schedules in the Philadelphia area. Some makers say they hortly will be out of the market or August shipment. Cold-drawn eliveries reflect the scarcity of hot tock more than lack of drawing fallities. However, shipment promises ary considerably. Some sellers are till able to book orders for late fune, while others haven't much tonge left for delivery before August.

In the Chicago district, users are ncreasing their consumption and are eeking to get on mill books for arger quantities. Rolling cycles on all grades have been stretched to make quick deliveries of many sizes and types out of the question. Automotive needs top the list, but farm machinery and general industry continue prominent in demand.

Bar and tool steel shipments in March (latest month for which data are available) totaled 1,099,611 tons, or 15.1 per cent of total steel movement from the mills. Of this total, 868,006 tons were carbon; 223,291 tons, alloy; and 8314 tons, stainless. Shipments in the first quarter totaled 2,882,737 tons, 14.9 per cent of the over-all movement.

Wire . . .

Wire Prices, Pages 156 & 157

Order backlogs are heaviest in New England on highway and building tonnage, wire for welded mesh, guard strand and miscellaneous larger sizes. Producers are booked into the fourth quarter on some of these items.

Manufacturers wire schedules are filled for June, with some third quarter volume being booked, although consumers are reluctant to take into consideration the need for longer lead time. This also holds true for

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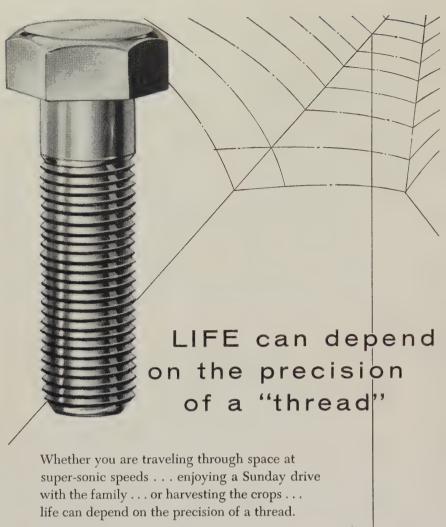
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In the Midwest, wire deliveries extend through June and substantia business is being booked for thire quarter shipment.

Wire product shipments in March totaled 398,476 net tons, or 5.5 per cent of total shipments. In the first quarter of this year wire accounted for 1,034,061 tons, or 5.3 per cent of total shipments. This compares with 4.7 per cent in the like period of last year.

Plates . . .

Plate Prices, Page 154

Instead of leveling off, plate de mand appears to be more active than ever. Structural and oil tank requirements are running high. The warehouses are specifying more free ly. Demand is even being boosted by shipyard and railroad needs, which are still far from heavy. Expormovement continues to be fair.

Eastern producers generally are booked through July and at the rate of present demand will soon be out of the market for August. If the wanted to take all the tonnage of fered them, they could close out schedules for the third quarter.

This is particularly true in the Philadelphia area where plate business got off to a relatively slow starthis year and is now making up fo lost time with a vengeance. Currently, plates are perhaps the mos active item in the steel product list despite only moderate improvement in shipwork and railroad equipment requirements.

Not only are the district producers being pressed for tonnage, but he leading distributors of diversified products say they are receiving more inquiry for plates than fo any other major product.

Most producers say their arrear ages will be substantial as they ginto the next quarter, so heavy habeen the flow of business over recenweeks. Increasing stringency is as cribed not only to heavier consumption but also to lack of strip plate. The continuous sheet and strip mill are centering production on the mor profitable lighter items. Buying als reflects stockpiling to some exten as a hedge against a shortage.

Plate demand is as strong in the Chicago market as is that for sheet with the second quarter a sellout an order books filling rapidly for the third quarter. Consumers' needs at pear solid and include all forms to heavy construction such as tank freight cars, pipelines and building

(Please turn to page 167)



of facilities in the Pollock plant and the open here is one of the examples where you can measure the value of Pollock facilities by extra steel production.

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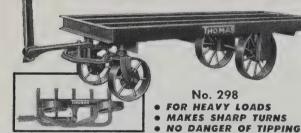
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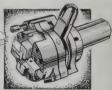




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Book Department, 1213 W. 3rd St., Cleveland 13, O.

(Concluded from page 164)

or three large pipelines are oding and award of any one could te an acute plate shortage in ntime.

late shipments amounted to 543,tons, or 7.5 per cent of total product shipments in March. st quarter plate tonnage was 1,-1,111 tons, or 7.4 per cent of all shipments, compared with 9.8 r cent a year ago.

ainless Steel . . .

Stainless Steel Prices, Page 153

production of stainless and heatr sting steel ingots totaled 290,646 tons in the first quarter of this ar, says the American Iron & Steel fititute. This was a substantial inlase over the 259,191-ton figure in 7rth quarter of 1954, and 187,111 is in the first quarter of last year. Chromium-nickel stainless output the first quarter amounted to 4,734 net tons; high chromium t-resisting steel 3434 tons; and er types, 113,478 tons. In the est quarter of 1954 chromium-nickel duction was 106,394 tons; high comium heat-resisting steel, 3960 s; and other types, 76,757.

pol Steel . . .

Tool Steel Prices, Page 158

Shipments of high speed and tool el (exclusive of hollow drill steel) aled 9869 net tons in March, rerts the American Iron & Steel Intute. In February, 7902 tons were pped. Figure for March of last ar: 8454 tons.

First quarter shipments amounted 25,593 net tons this year. In the e period last year, 24,002 tons were oved by producers.

ubular Goods . . .

Tubular Goods Prices, Page 158

While some decline in demand for be specialties is expected in July, ders for other tubular goods are pected to remain strong well into e third quarter.

Mechanical tubes and seamless bes for oil country use are in heavy mand with no letup in sight. Procers have order backlogs extendg two months.

Specialties are moving slower. Proicers are taking orders for July ipment. Seamless pressure tube les are weak, but a pickup is exected in requirements on utilities acunt later this year.

Cast iron pipe requirements are seasonally. In the Pacific Northest the market continues active, ith considerable new inquiry re-

Ores

Lake Superior Iron Ore
(Prices effective for the 1955 shipping season; gross ton, 51.50% iron natural, rail of vessel, lower lake ports)
 Old range bessemer
 \$10.40

 Old range nonbessemer
 10.25

 Mesabl bessemer
 10.25

 Mesabl nonbessemer
 10.10
 Open-hearth lump 11.25 High phosphorus 10.00 Eastern Local Iron Ore Cents per unit, deld, E. Pa. Foundry and basic 52-62% concentrate contract Rail nearest seller 18% 3:1 Molybdenum Per unit of Sb content, c.i.f. seaboard

Ketractories

Ketractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., \$94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalla, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., \$114; Sallna, Pa., \$119; Niles, O., \$125; Los Angeles, Pittsburg, Calif., \$137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., \$120; Warren, Niles, O., Hays, Pa., \$125; Los Angeles, Poilet, Rockdale, Ill., \$130; Cutler, Utah, Joliet, Rockdale, Ill., \$130; Cutler, Utah, \$121.55; Los Angeles, \$127.85, Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., \$137; Morrisville, Pa., Niles, O., \$140; Joliet, Ill., \$143.

Semisilica Brick (per 1000)

Clearfield, Pa. \$130; Philadelphia, \$116; Woodbridge, N. J., \$114.

Insulating Fire Brick (per 1000)

Clearfield, Pa., Mexico, Mo., \$206; Vandalia, Mo., \$214.10; Portsmouth, O., \$207.50; Bessemer, Ala., \$212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., \$64.60; Alsey, Marchard and Control of the
Ala., \$212.80.

Dry Pressed: Bessemer, Ala., \$64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., \$77.50; Wellsville, O., \$81.50; Clearfield, Pa., Portsmouth, O., \$87; Perla, Ark., \$109; Los Angeles \$110.25; Pittsburg, Calif., \$111.30.

Los Angeles \$110.25; Pittsburg, Calif., \$111.30.

High-Alumina Brick (per 1000)

50 Per Gent: Clearfield, Pa., \$1. Louis, Mexico, Mo., \$181; Danville, III., \$169.30.

60 Per Gent: St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., \$225; Danville, III., \$213.20.

70 Per Gent: St. Louis, Mexico, Vandalia, Mo., \$260; Danville, III., \$258; Clearfield, Pa., \$267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., \$147; Clearfield, Pa., \$148.50; St. Louis, \$159.30; Athens, Tex., \$155.

Nozzies (per 1000)

Reesdale, Pa., \$234.70; Johnstown, Pa., \$240.70; Clearfield, Pa., \$241.40; St. Louis, \$259.45; Athens, Tex., \$247.70; Bridgeburg, Pa., \$267.50.

Runners (per 1000)
Reesdale, Johnstown, Bridgeburg, Pa., \$183.50; Clearfield, Pa., \$185.50; St. Louis, \$195.80; Athens, Tex., \$191.80.

Dolomite (per net ton)
Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nerlo, Gibsonburg, Woodville, O., \$14.50; Thornton, McCook, Ill., \$15.10; Dolly Siding, Bonne Terre, Mo., \$13.65.

Magnesite (per net ton)
Domestic, dead-burned bulk, %-in, grains with fines: Luning, Nev., Chewelah, Wash., \$38.

Metallurgical Coke

Beehive Ovens
Connellsville, furnace\$13.50-\$14.00
Connelisville, foundry
Oven Foundry Coke
Kearny, N. J., ovens\$24.50
Camden, N. J. ovens
Everett, Mass., ovens
New England, deld*26.05
Chicago, ovens 24.50
Chicago, deld 26.00
Terre Haute, Ind., ovens 24.05
Milwaukee, ovens
Indianapolis, ovens
Cincinnati, deld
Painesville, O., ovens
Cleveland, deld 27.43
Erie, Pa., ovens
Birmingham, ovens
Cincinnati, deld 27.58
Buffalo ovens
Buffalo, deld
Lone Star, Tex., ovens 18.50
Philadelphia, ovens 24.00
Swedeland, Pa., ovens 24.00
St. Louis, ovens
St. Louis, deld 26.00
St. Paul, ovens
Portsmouth, O., ovens 24.00
Cincinnati, O., deld
Detroit, ovens
Detroit, deld
Pontiac, deld 27.06
Saginaw, deld 28.58

*Or within \$4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens	
Pure benzol	. 36.00
Toluol, one deg32.0	0-35.00
ndustrial xylol32.0	0-35.00
Per ton bulk, ovens	0 00
Per ton, bulk, ovens	10 015
sulphate of ammonia	42-340
Birmingham area	.42.00†

†With port equalization against imports.

Cents per pound, producing point
Phenol, 40 deg. (U.S.P.), tank cars 18.00
c.l. drums 19.00
l.c.l. drums 19.50

Huorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF₂ content 72.5%, \$35-\$36; 70%, \$32.\$33; 60%, \$28-\$29. Imported, net tons, duty paid, metallurgical grade: European, \$28-\$30; Mexican, \$25.50.

Electrodes

Threaded	GRAPHITE	.b. plant
	-Inches	Per
Diam	Length	100 lb
2	24	\$47.75
	30	30.75
2½ 3 4 5½ 6	40	30.00
4	40	28.50
51/4	40	28.25
6	60	25.50
7	60	25.25
8, 9, 10	60	22.75
12	72	26.00
14	60	22.50
16	72	21.50
17	60	22.00
18	72	21.50
20	72	21.25
	CARBON	
8	60	11.40
14, 12, 10	60	11.10
14	72	10.25
17	60	10.25
17	72	9.85
20	84	9.85
20	90	9.65
24	72, 84	9.85
24	96	9.60
30	84	9.75
40. 35	110	9.50
40	100	9.50

ported developing, including tonnage required for Alaskan projects.

National Tube Division, U. S. Steel Corp. has awarded a contract to the Gas Machinery Co., Cleveland, for two tube upset furnaces to be installed at the Lorain, O. works.

The new expanded steel pipe mill of U. S. Steel's Consolidated Western Division at Provo, Utah, recently produced its first carload of pipe for its first customer, Pacific Northwest Pipeline Corp.

Atlantic Seaboard Corp., Charleston, W. Va., has been authorized by the Federal Power Commission to construct about 84 miles of pipeline in West Virginia, Virginia and Maryland. The line will require 26-in. pipe.

Warehouse . . .

Warehouse Prices, Page 159

Distributors report active demand for all products. It is an orderly type of demand, and is devoid of the feverish pitch characteristic of the Korean war period. Sheet and plate consumers, who normally buy from mills, show no inclination to pay warehouse prices for large quantities. Plates are in the most pressing demand in the Mid-Atlantic territory, and more buyers of mill ton-

nages are turning to distributors for relief.

In the St. Louis district, business is brisk, with the prospect that some shortages in sizes is inevitable in the next few months. Mill deliveries to some warehouses already are extended, causing unbalanced inventories. Scarcities appear most likely in cold-finished bars and plates. Some structurals are in short supply.

Some large consumers in the Pittsburgh district are trying to accumulate inventories. These firms can't obtain extra steel from mills and are turning to warehouses. Consumers of small tonnages are slightly more active in the market.

Though sales have risen consistently during the last few months, distributors are cautious in their forecasts for the balance of the year. Some dip in warehouse business in June and July is expected as manufacturing plants shut down for vacations.

On the West Coast, quicker mill deliveries have pushed warehouse stocks above 100 per cent of normal in some products, Wide-flanged beams are in particularly active demand.

Conditions in the British Colum-

bia warehouse trade are similar to those across the border. Shortages are developing in some products,

Automatic multiple torch burning equipment has been installed at U. S. Steel Supply Division's warehouse in San Francisco. It can cut shapes up to 12 ft wide and 42 ft in length from plates up to 10 in. thick.

O'Neal Steel Co., Birmingham, opened a warehouse at 1240 Williams St., Chattanooga, Tenn. This is a temporary location until the company can purchase suitable property for construction of a larger and more modern warehouse.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 167

March output of coke was 6,235,824 net tons, reports the Bureau of Mines. This compares with 5,394,166 tons in February and 5,144,689 in March a year ago. Of total March production, 6,130,731 tons were oven coke and 105,093 beehive.

Oven coke stocks at the end of March totaled 2,525,662 tons or 12.8 days' production.

U. S. Pipe & Foundry Co. will install 30 Koppers chemical recovery coke ovens at its North Birmingham, Ala., plant at a cost of more than \$1 million.

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LIMA, OHIO



. . the FINEST in Permanent Magnetic Equipment for Industry

rent Ferroalloy Quotations

MANGANESE ALLOYS

wheisen: (19-21% Mn, 1-3% Si), Carlot pross ton \$86, Palmerton, Pa.; \$87 Clair-ind Duquesne, Pa.

40 19% Mn) \$84 per ton, Palmerton, Pa.; er ton, Clairton and Duquesne, Pa.

(ard Ferromanganese: (Mn 74-76%, C 7% X.). Base price per net ton \$190, Clairton, esne, Johnstown and Sheridan, Pa.; Alloy, a.; Ashtabula, Marietta, Philo, O.; Shef-Ala.; Portland, Oreg., and Tacoma, Add or subtract \$2.00 for each 1% or on thereof of contained manganese over nor under 74%, respectively.

79-81%) Lump \$198 per net ton, f.o.b. anda or Great Falls, Mont. Add \$2.60 for 1% above \$14%; subtract \$2.60 for each below 76%, fractions in proportion to

**Carbon Ferromanganese, Regular Grade: 485-90%). Carload, lump, bulk, max, 1% C, 29.95c per lb of contained Mn, carpacked 30.7c, ton lots 31.8c, less ton Delivered, Deduct 1.5c for max 0.15% ade from above prices, 3c for max, 0.30% 5c for max 0.50% C, and 6.5c for max C—max 7% Si. Special Grade: (Mn min, C 0.07% max, P. 0.06% max). 4.2.05c to the above prices. Spot, add 0.25c.

Cam-Carbon Ferromanganese: (Mn 80-85%, 5% max). Carload, lump, bulk 21.35c per contained Mn, carload packed 22.1c, ton 323.2c, less ton 24.4c. Delivered. Spot, 60.25c.

ranese Metal: 2" x D (Mn 95.5% min, Fe max, Si 1% max, C 0.2% max): Carlump, bulk, 45c per lb of metal; ed, 45.75c; ton lot 47.25c; less ton lots ic. Delivered. Spot, add 2c.

Tholytic Manganese Metal: Min carloads. 0 2000 lb to min carloads, 32c; 250 lb to lb 34c. Premium for hydrogen-removed 1, 0.75c per lb. Prices are f.o.b. cars, swille, Tenn., freight allowed to St. Louis 100 any point east of Mississippi; or f.o.b. setta, O., freight allowed.

fomanganese: (Mn 65-85%). Contract, c., bulk 1.50% C grade, 18-20% Si, 11.00c olb of alloy, carload packed 11.75c, ton lots 5c, less ton 13.65c. Freight allowed, For C grade, Si 15-17%, deduct 0.2c from gre prices. For 3% C grade, Si 12-14.5%, lct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

tottanium, Low-Carbon: (Ti 20-25%, Al max, Si 4% max, C 0.10% max). tract, ton lots 2" x D, \$1.50 per lb of ained Ti; less ton \$1.55. (Ti 38-43%, Al max, Si 4% max, C 0.10% max). Ton \$1.35, less ton \$1.37, f.o.b, Niagara Falls, Y, freight allowed to St. Louis. Spot,

votitanium, High-Carbon: (Ti 15-18%, C %). Contract \$177 per ton, f.o.b. Ni-ra Falls, N. Y., freight allowed to destina-s east of Mississippi river and north of imore and St. Louis.

rotitanium, Medium-Carbon: (Ti 17-21%, C 5%. Contract \$195 per ton, f.o.b. Ni-ra Falls, N. Y., freight not exceeding St. is rate allowed.

CHROMIUM ALLOYS

h-Carbon Ferrochrome: Contract, c.l., p, bulk 24.75c per lb of contained Cr; c.l. ked 25.65c, ton lot 26.80c, less ton 28.20c. ivered. Spot, add 0.25c.

v-Carbon Ferrochrome: (Cr 67-72%), Cont., carload, lump, bulk, C 0.025% max. mplex 34.50c per lb contained Cr, 0.03% C 50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.6 C 32.85c, C 32.75c. Carload packed add 1.1c, ton add 2.2c, less ton add 3.9c, Delivered, Spot, 1.25c.

undry Ferrochrome, High-Carbon: (Cr 62-%, C 5-7%). Contract, c.l. 8 M x D, bulk, 25c per lb contained Cr. Packed, c.l. 15c, ton 28,50c, less ton 30.25c. Delivered. t, add 0.25c.

indry Ferrochrome, Low-Carbon: (Cr 50-6, Si 28-32%, C 1.25% max). Contract, load, packed, 8 M x D, 18.35c per lb of y; ton lot 19.2c; less ton lot, 20.4c, deliv-d; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Contract, 1" x D; packed, max 0.50%, carload \$1.16, ton lots \$1.18; less ton \$1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, \$3.00 per 1b of contained V. Delivered. Spot, add 10c. Crucible-Special Grades (V 50-55%, Si 2-3.5% max, C 0.5-1% max) \$3.10. Primos and High Speed Grades (V 50-55%, Si 1.50% max, C 0.20% max) \$3.20.

Grainal: Vanadium Grainal No. 1, \$1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

 $\begin{array}{lll} \textbf{Vanadium} & \textbf{Oxide:} & \textbf{Contract, less carload lots} \\ \textbf{\$1.28 per lb contained} & \textbf{V}_2\textbf{O}_5, & \textbf{freight allowed.} \\ \textbf{Spot, add 5c.} & \end{array}$

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

carload, lump, 50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.5c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices. 65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

carload, lum 75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer, (Approx. 20% Al, 40% Si, 40 Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25,25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, \$1.20 per lb of alloy. Less than 100 lb \$1.30. Delivered, spot add 5c, F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) \$1.20; Grade C (19% min M) \$1.50.

Borosil: (3 to 4% B, 40 to 45% Si). \$5.25 per lb contained B, delivered to destination.

(B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%), Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per 1b of alloy, carload packed 20.8c, ton 1ot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c. carload

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.05c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld, Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 11.85c per lb of briquet, c.l. packaged 12.85c, ton lot 13.65c, less ton 14.55c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si), Contract, c.l, bulk 12.45c per lb of briquet, c.l, packaged 13.45c, ton lot 14.25c, less ton 15.15c, Delivered, Add 0.25c for notching, Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.55c per lb of briquet. Packed c.l. 7.55c, ton lot 8.35c, less ton 9.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.7c. Packaged c.1. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) \$1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more \$3.80 per lb of contained W; 2000 lb W to 5000 lb W, \$3.90; less than 2000 lb W, \$4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, \$12 per lb of contained Cb, less ton \$12.05. Delivered. Spot, add 10c.

Ferrotitanium—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, \$6 25 per lb of contained Cb plus Ta, deld.; less ton lots

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%), Carloads packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graph:dox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%), C.l. packed, 17.50c per lb of alloy, ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal, Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based rerropnosphorus: (23-25% based on 24% P content with unitage of \$4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt, Pleasant, Siglo, Tenn., \$90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., \$1.46 in all sizes except powdered which is \$1.57; Washington, Pa., furnace, any quantity, \$1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., \$1.25 in cans; in bags, \$1.24, f.o.b, Langeloth, Pa.; Washington, Pa., \$1.24.

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for rapid deburring and chamfering openly accessible hole faces.







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rap . . .

Scrap Prices, Page 172

hiladelphia—Prices on the major mill grades continue to ease.

1 heavy melting steel, No. 1 busheling are dilable at \$35.50-\$36.50, delivered.

2 heavy melting is unchanged at 50, but No. 2 bundles are lower \$26.50. Other grades, including t, are steady.

export shipments are holding up fil, but buying has eased off resulty. Foreign buyers, noting the sing in the domestic market, are blined to mark time after reducing ering prices anywhere from 50 its to \$1 a ton.

Chicago—Weakening in scrap conjues, with steelmaking consumers ying \$1 less for No. 2 heavy meltg and No. 1 dealer bundles. No. 1 lroad heavy melting and turnings od borings were quoted off 50 cents ton. The decline took place in a face of near-record steel producon.

Pittsburgh—The latest purchase of avy melting scrap and bundles esplished prices averaging \$1 below ose quoted a week ago. The buy is by a major Pittsburgh steel-aker. The price decline reflected akness resulting from sizable mill ventories. The tendency also was wnward in railroad scrap. Most rent purchases of No. 1 railroad avy melting were at \$36-\$37, \$1.50 low the preceding week's quotation, hich also represented a decline.

New York—Brokers reduced their tying prices \$1 a ton on four margrades. They are offering \$31-2 for No. 1 heavy melting and 0. 1 bundles, \$27-\$27.50 for No. 2 avy melting and \$22-\$23 for No. 2 andles. All other grades are unnaged.

Cleveland—The scrap market is ktremely sluggish. No purchases of onsequence were reported here last eek except for one buy of foundry crap by Ford. Prices are holding to the lower levels established two reeks ago. Mill inventories are subtantial. With the flow of scrap to ne market seasonally heavy, the tenency is for prices to sag.

Buffalo—Although steelmaking oprations are holding above theoretical apacity, easier tendencies prevail in ne scrap market here following reent sales to district mills at lower rices.

Birmingham—Improvement in suply of steel scrap has resulted in an tlanta mill eliminating the springoard it established a few weeks ago or remote scrap. It still is getting sufficient supply at the lower rices. Foundries, too, have elimiated the springboard in effect nearly all winter for scrap outside the district. Dealers say supplies of all grades of scrap are moving into yards more freely than for some time.

St. Louis—Scrap prices here are holding despite softening elsewhere. Local prices have stayed below those at some other points.

Youngstown—The scrap market here has been hit by falling prices and reduced demand. Top grades of dealer material have declined \$2 to \$3 a ton.

Detroit—The scrap market shows a tendency toward softness due to oversupply. Trading is expected to be quiet for the next couple weeks, or until automotive lists come out for bids.

Washington—Consumption of ferrous scrap in March (6,052,000 gross tons) was the highest since May, 1953, reports the Bureau of Mines. The daily consumption rate and tonnage used were up 13 per cent from the previous month. At the same time, pig iron consumption rose 12 per cent to 5,537,000 tons.

The melt of scrap and pig iron (11,589,000 gross tons) in March was the largest since May, 1953, consisting of 52.2 per cent scrap and 47.8 per cent iron. This compared with 51.9 per cent scrap and 48.1 per cent pig iron in February.

Stocks of scrap held by consumers amounted to 6,404,000 gross tons at the end of the month, a slight increase over the February total. The 2,041,000 tons of pig iron held by consumers and suppliers were 4 per cent less than at the end of the previous month, a decrease for the third consecutive month.

Los Angeles—Increased foundry purchases of No. 1 cupola cast have firmed the cast scrap market. Steelmaking grades, largely specialties, are moving in a limited way.

San Francisco—Higher steel scrap prices reflect foreign competition for material and increased local consumption. One big producer last week operated at 105 per cent of rated capacity.

Vancouver, B. C.—Practically all scrap produced in British Columbia is bought for local consumption. The new mill at Edmonton will absorb the scrap from Alberta province, with freight rates from that area making it unprofitable to ship into British Columbia.

Ferroalloys . . .

Ferroalloy Prices, Page 169

Tennessee Products & Chemical Corp., Nashville, Tenn., recently acquired by Merritt-Chapman & Scott Corp., New York, has expanded its operations to include production of ferrochrome.

Structural Shapes . . .

Structural Shape Prices, Page 154

Reflecting the seasonal pickup in construction demand, shipments of steel products on building account in March rose to 804,516 net tons, 11.6 per cent of total steel mill shipments. In February, 594,660 tons of construction steel were shipped by the mills, or 10.2 per cent of the overall total movement.

Shipments to an allied consumption category—contractor products—
(Please turn to page 174)



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CHERROTEE CONSTRUCTION

Iron and Steel Scran

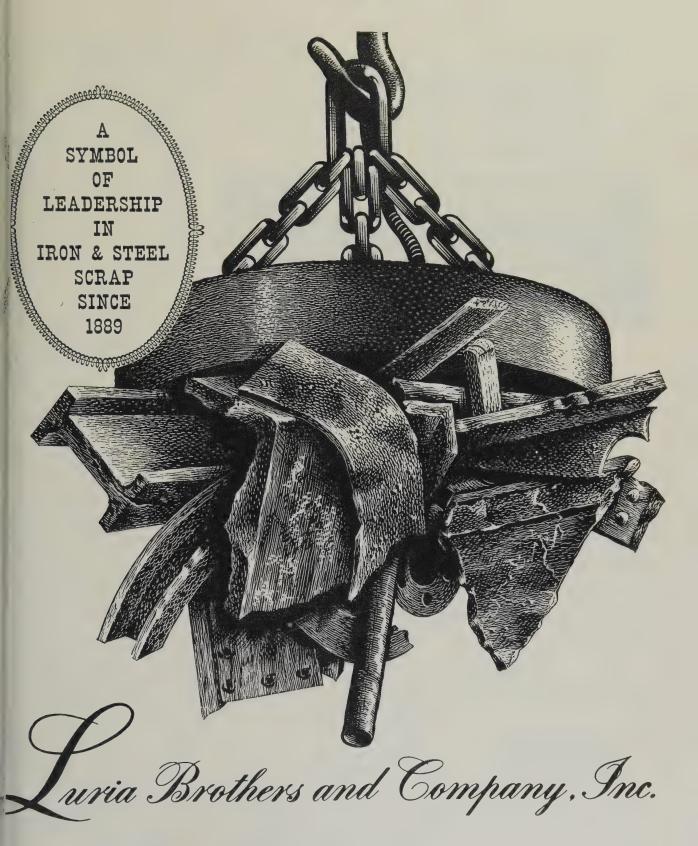
Iron and Steel Scrap	Consumer prices, per gross ton, STEEL. Changes shown in italics.	except as otherwise noted, including	broker's commission, as reported
STEELMAKING SCRAP	YOUNGSTOWN	PHILADELPHIA (Delivered consumer's plant)	ST. LOUIS (Brokers' buying prices)
COMPOSITE May 11 \$34.83 May 4 35.33 April Avg. 36.73 May 1954 28.00 May 1950 33.82	(Delivered consumer plant) No. 1 heavy melting 34.00-35.00 No. 2 heavy melting 29.00-30.00 No. 1 bundles 34.00-35.00 No. 1 bundles 34.00-35.00 Machine shop turnings 16.00-17.00 Short shovel turnings 23.00-24.00 Cast iron borings 23.00-24.00	No. 1 heavy melting 35.50-36.50 No. 2 heavy melting 32.50 No. 1 bundles 35.50-36.50 No. 1 busheling 35.50-36.50 Electric furnace bundles 39.50 Machine shop turnings. 21.50 Mixed borings, turnings 21.50	
Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.	Low phos. 35.00-36.00 Electric furnace bundles 34.00-35.00 Railroad Scrap No. 1 R.R. heavy melt. 35.00-36.00 CHICAGO	Short shovel turnings 24.00 Structurals & plate 40.00-41.00 Heavy turnings 34.00-35.00 Couplers, springs, wheels Rail crops, 2 ft & under 51.00-52.00 Cast Iron Grades	No. 1 cupola 40.0 Charging box cast 33.0 Heavy breakable cast 33.0 Unstripped motor blocks 33.0 Brake shoes 32.0 Clean auto cast 42.0 Stove plate 34.0
PITTSBURGH (Delivered consumer's plant) No. 1 heavy melting 34.00-35.00 No. 2 heavy melting 31.00-32.00 No. 1 bundles 34.00-35.00 No. 2 bundles 26.00-27.00	No. 1 heavy melting 33.00-35.00 No. 2 heavy melting 29.00-30.00 No. 1 factory bundles 35.00-36.00 No. 1 dealer bundles 33.00-34.00 No. 2 bundles 24.00-25.00 Mo. 1 busheling 33.00-35.00 Machine shop turnings 16.00-17.00	No. 1 cupola	Railroad Scrap No. 1 R.R. heavy melt. Rails, 18-in, and under Rails, random lengths. Rails, rerolling Angles, splice bars 41.0
No. 1 busheling 34,00-35.00 Machine shop turnings. 21.00-22.00 Mixed borings, turnings 21.00-22.00 Short shovel turnings 24.00-25.00 Cast iron borings 24.00-25.00 Cut structurals, 5 ft lengths 39.00-40.00	Mixed borings, turnings. 18.00-19.00 Short shovel turnings. 18.00-19.00 Cast iron borings 18.00-19.00 Cut structurals, 3 ft 36.00-37.00 Punchings & plate scrap 37.00-38.00 Electric furnace bundles 35.00-36.00 Cast Iron Grades	No. 1 heavy melting 31.00-32.00 No. 2 heavy melting 27.00-27.50 No. 1 bundles 31.00-32.00 No. 2 bundles 22.00-23.00 Machine shop turnings 12.00-13.00 Mixed borings, short 14.00-15.00	SEATTLE
Heavy turnings 34.00-35.00 Punchings & plate scrap 39.00-40.00 Electric furnace bundles 38.00-39.00 Cast Iron Grades No. 1 cupola 39.00-40.00	No. 1 cupola 40.00-41.00 Stowe plate	Short shovel turnings. 15.00-16.00	No. 3 bundles
Charging box cast 34.00-35.00 Heavy breakable cast 34.00-35.00 Unstripped motor blocks 25.00-26.00 No. 1 machinery cast 43.00-44.00 Railroad Scrap No. 1 R.R. heavy melt 36.00-37.00	No. 1 R.R. heavy melt 36.50-37.50 R.R. malleable 46.00-47.00 Rails, 2-ft and under 50.00-51.00 Rails, 18-in, and under 51.00-52.00 Angles, splice bars 44.00-45.00 Rails, rerolling 52.00-53.00	Heavy breakable 33.00-34.00 Stainless Steel 18-8 sheets, clips, solids	Cast Iron Grades (F.o.b. shipping point) No. 1 cupola
Rails, 2 ft and under 47.00-48.00 Rails, 18 in. and under . 48.00-49.00 Rails, random lengths 43.00-44.00 Railroad specialties 42.50-43.50 Stainless Steel Scrap	Stainless Steel Scrap 18-8 bundles & solids. 220.00-225.00 18-8 turnings	430 sheets, clips, solids 85.00-90.00 410 sheets, clips, solids 70.00-75.00 BOSTON (Brokers' buying prices; f.o.b. shipping point)	Railroad Scrap (Delivered consumer's plant) Rails, random lengths 34.0
18-8 bundles & solids. 210.00-220.00 18-8 turnings105.00-110.00 430 bundles & solids 95.00-100.00 430 turnings	(Week ended May 11) No. 1 Heavy Melting High Low Close Oct 35.50 35.50 35.50* Jan	No. 1 heavy melting 23.00-29.00 No. 2 heavy melting 22.00-23.00 No. 1 bundles 27.50-28.50 No. 2 bundles 16.00-17.00 Machine shop turnings 12.00-12.50 Mixed borings, turnings 14.00-15.00 Short shovel turnings 15.50-16.50	LOS ANGELES No. 1 heavy melting. 28.0 No. 2 heavy melting. 24.0 No. 1 bundles 27.0 No. 2 bundles 22.0 Machine shop turnings. 8.6
(Delivered consumer plant) No. 1 heavy melting 31.00-32.00	Sales (160-ton units): 1 October. *Nominal	No. 1 cast	Cast Iron Grades (F.o.b. shipping point)
No. 2 heavy melting	DETROIT (Brokers' buying prices; f.o.b. shipping point) No. 1 heavy melting 27.50 No. 2 heavy melting 27.50 No. 1 bundles 27.50 No. 2 bundles 19.00 No. 1 busheling 27.50 Machine shop turnings 13.00 Mixed borings, turnings 13.00 Short shovel turnings 16.50 Punchings & plate scrap 33.00 Cast Iron Grades	BUFFALO No. 1 heavy melting 30.00-31.00 No. 2 heavy melting 26.00-27.00 No. 1 bundles 30.00-31.00 No. 1 bundles 24.00-25.00 Mixed borings, turnings 20.50-21.50 Machine shop turnings 19.00-20.00 Short shovel turnings 21.50-22.50 Cast iron borings 20.50-21.50 Low phos 33.00-34.00 Cast Iron Grades	No. 1 cupola
Cast Iron Grades No. 1 cupola	Charging box cast	(F.o.b. shipping point) No. 1 cupola 37.00-38.00 No. 1 machinery 42.00-43.00 Railroad Scrap Rails, random lengths 35.00-36.00 Rails, 3 ft and under 42.00-43.00 Railroad specialties 36.50-37.50 CINCINNATI (Brokers' buying prices; f.o.b. shipping point)	Heavy turnings
Railroad Scrap No. 1 R.R. heavy melt. 34.00-35.00 R.R. malleable	No. 1 busheling 32.00-33.00 Cast iron borings 17.00-18.00 Short shovel turnings 25.00-26.00 Machine shop turnings 19.00-20.00 Electric furnace bundles 32.00-33.00 Cast Iron Grades (F.o.b. shipping point) No. 1 cupola 45.00-46.00 Stove plate 42.00-43.00 Bar crops and plate 36.00-37.00 Unstripped motor blocks 35.50-36.50	No. 1 heavy melting 31.50-32.50 No. 2 heavy melting 28.50-29.50 No. 1 bundles 22.50-23.50 No. 2 bundles 22.50-23.50 No. 1 busheling 31.50-32.50 Machine shop turnings 19.00-20.00 Mixed borings, turnings 17.50-18.50 Short shovel turnings 17.50-18.50 Cast iron borings 17.50-18.50 Low phos., 18-in 38.00-39.00 Cast Iron Grades No. 1 R.R. heavy melt. 32.50-33.50 Heavy breakable cast 35.00	Drop broken machinery HAMILTON, ONT. (Delivered prices) No. 1 heavy melting. 31. No. 2 heavy melting. 31. No. 2 bundles 28. Mixed steel scrap 28. Mixed borings, turnings 16. Rails, remelting 43. Busheling, new factory: Prepared 32.
(Brokers' buying prices; f.o.b. shipping point) 18-8 bundles, solids200.00-210.00 18-8 turnings100.00-110.00	Railroad Scrap No. 1 R.R. heavy melt. 36.00-37.00 Rails, 18 in. and under 45.00-46.00 Rails, rerolling	Charging box cast 36.00 Drop broken machinery 45.00-46.00 Railroad Scrap	Unprepared 28. Short steel turnings 16. Cast Iron Gradest

No. 1 R.R. heavy melt. 32.50-33.50 No. 1 machinery cast. 42.00-45. Rails, 18-in. and under 48.00-49.00 Fails, random lengths. 40.00-41.00 Fo.b., shipping point.

Railroad Scrap

| Stainless Steel | (Brokers' buying prices; f.o.b. shipping point) | 18-8 bundles, solids ... 200.00-210.00 18-8 turnings ... 100.00-110.00 430 clips, bundles, solids ... 90.00-100.00 430 turnings ... 40.00-50.00

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CORAOPOLIS, PA.

(Concluded from page 171)

accounted for 323,650 tons, or 4,6 per cent of the total steel movement in March.

Structural steel inquiry is active in the East. Also, it is diversified Not only is there a substantia amount of public work, but a grow. ing demand for apartments, office buildings and stores is noted.

Inquiry in the Philadelphia market is featured by the largest Pennsylvania turnpike job in some time-4250 tons of bridgework in Carbon county. Otherwise, demand in the district is light, a situation reflected in limited backlogs at some of the smaller shops.

New construction awards in 2' counties of western Pennsylvania mounted to \$39.6 million in March a new record for that month.

Structural shape deliveries are not too badly extended in all instances It is still possible for a consumer to get tonnage for July shipment, including wide-flange sections. At Pittsburgh, however, the mills find it difficult to accept early third quarter orders for wide-flange beams while their delivery time for standard structurals is two months.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

7500 tons, Vancouver, B. C., post office build ing, to Western Bridge & Steel Fabricator Ltd. and Dominion Bridge Co. Ltd.. Van COUVER

3000 tons, Oak St. toll bridge, Fraser river to Dominion Bridge Co. Ltd., Vancouver

3000 tons, two power plants, Johnstown, Pa and Rochester, N. Y. Works, Eddystone, Pa. Y., to Belmont Iron

2500 tons, 28 palletizing furnaces, Erie Mining Co., Aurora, Minn., to Bethlehem Steel Co. Bethlehem, Pa.

2015 tons, seven bridges, Massachusetts turn pike, Palmer, Mass., to Harris Structura Steel Co., New York; Berlanti Constructio Co. Inc., Harrison, N. Y., general contractor

100 tons, addition, Harlem Municipal Hos pital, New York, Psaty & Furman, low o 1400 tons, general contract.

1125 tons, 12 bridges, Massachusetts turnpike Westfield-West Springfield, Mass., to Erns Construction Corp., Buffalo; Lane Construc-tion Co., Meriden, Conn., general contractor to tons, processing plant, Carnation Co. 900 tons,

Seattle, to Isaacson Iron Works, Seattle. 865 tons, apartment, E. 20th St. and Thir Ave., New York, through H.R.H. Construc-tion Co., general contractor, to America Bridge Division, U. S. Steel Corp., Pitts

445 tons, junior and senior high schools, Lima Pa., Delaware county, to Morris, Wheele & Co., Philadelphia.

335 tons, school, Shamokin, Pa., to Weatherl Steel Co., Weatherly, Pa.

315 tons, pumping plant, Hanford Works, t Bethlehem Pacific Coast Steel Corp., Seattle

STRUCTURAL STEEL PENDING

4250 tons, bridgework, Sec. 36-EF, state turn

pike, Carbon county, Pa.; bids June 8. 2200 tons, tower steel, Bonneville Power Ad ministration, Portland, Oreg.; Bethleher Pacific Coast Steel Corp., Seattle, apparent ly low at \$516,966, f.o.b. Seattle,

650 tons, Alaska railroad terminal, Seward Alaska, bids in to U. S. Engineer; low bid undetermined.

450 tons, addition to police station, Portland

O.; O. E. Wayman, Portland, Oreg., low B. 764.079.

2 ns, state bridgework, York county, Pa.; May 27,

is, state bridgework, Potter county, Pa.; May 27

OFFORCING BARS . . .

REINFORCING BARS PLACED

ons, Oak St. toll bridge, Fraser river, sh Columbia, to Dominion Bridge Co.,

ns, six military installations in Alaska, Bethlehem Pacific Coast Steel Corp., tle.

ns, Home for the Aged, Philadelphia, to rete Steel Co., that city.

ns, Washington state, Thurston county crossing, to Bethlehem Pacific Coast Corp., Seattle; A. J. Cheff Construc-Co., Seattle, general contractor, low at ,367.

ons, Sheraton Hotel, Philadelphia, to trican Engineering Co., that city (structure requirements were placed recently with sylehem Steel Co., Bethlehem, Pa.).

EREINFORCING BARS PENDING

.)ns, Alaska railroad terminal, Seward, ska; general bids under consideration. ns, Medical Center, American Federation

ns, public school, Wayne and Johnson, adelphia; bids asked.

ons, state bridge work, Berks county, bids May 27,

TES . . .

PLATES PLACED

ms, storage tanks for Texaco Co., Coos C, Oreg., to Consolidated Western Steel

CAST IRON PIPE PLACED

ons, system expansion, Corvallis, Oreg., i Pacific States Cast Iron Pipe Co., Port-Ol, Oreg.

ons, system expansion, Seattle, to U. S. e & Foundry Co., Seattle.

CAST IRON PIPE PENDING

tions, system improvements, Anchorage, iska; bids May 18.

Tons, bids to Kent, Wash., May 16.

Ons, 6 in.; bids to Edmonds, Wash., May

STEEL PIPE PLACED

00 tons, 30 and 36 in. gas line pipe from w Mexico gas fields to Pacific Northwest Consolidated Western Steel Corp. and iser Steel Co. by Pacific Northwest Pipe-Corp.

ons, 30-in. pipe, Erie Mining Co. nn., to Bethlehem Steel Co., Bethlehem,

ons, steel pipe, Erie Mining Co., Taconite rbor, Minn., to Bethlehem Steel Co., hlehem, Pa.

LS, CARS . . .

LOCOMOTIVES PLACED

dian National, one 1750-hp diesel unit, General Motors Diesel Ltd.

LOCOMOTIVES PENDING

ern Pacific, eight 1750-hp general-purpose sel units; purchase authorized.

RAHLROAD CARS PLACED

emer & Lake Erie, heavy repairs of 250 venty-ton hopper cars, contract awarded Greenville Steel Car Co., Greenville, Pa.
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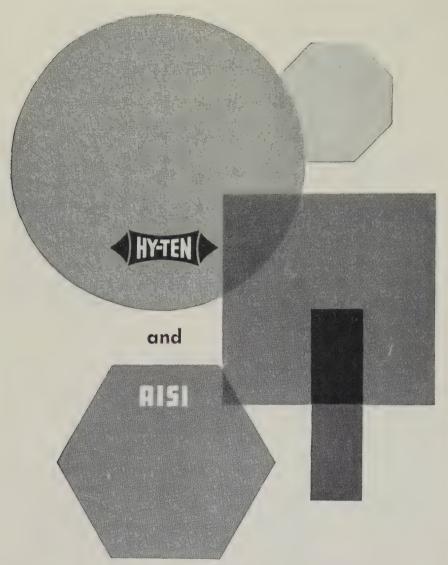
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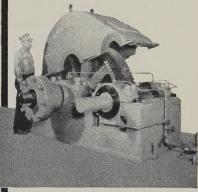
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Chromium and Its Effects in Alloy Steels

As previously pointed out in this series, the elements that together make up an alloy steel work both singly and collectively. In a sense they are like the components of a machine, each having its job to do, yet each working with other components to achieve an overall result.

An earlier discussion was devoted to the functions of nickel. In this one we shall outline briefly some of the purposes of chromium, another of the fundamental alloying elements.

Chromium is a versatile agent. Among other things, it fosters depth-hardenability, improves surface resistance to abrasion and wear, and promotes carburization. Of the common alloying elements, chromium ranks near the top in hardenability. This property tends to make high-chromium steels relatively air-hardening; hence it is valuable in applications where, for one reason or another, liquid quenches are undesirable.

Chromium steels are relatively stable at high temperatures and are often used where resistance to heat is important. Moreover, the presence of chromium is a vital factor in helping to retard or prevent corrosion.

The uses of chromium steels are many and varied. Among the more

familiar items that often contain chromium are hand tools, gears, springs, turbine wheels, ball and roller bearings, forged shafts and rotors, etc. There are of course numerous others; virtually no list would be all-inclusive.

One of the most useful of the alloys, chromium has been the subject of long study by Bethlehem metallurgists. These technicians have a thorough working knowledge of its effects in various types of analyses. Whenever you have a problem involving chromium steels, or would like to know more about the subject in general, by all means communicate with the Bethlehem staff. Our men will come to your office or plant at any time. You will find them co-operative and helpful.

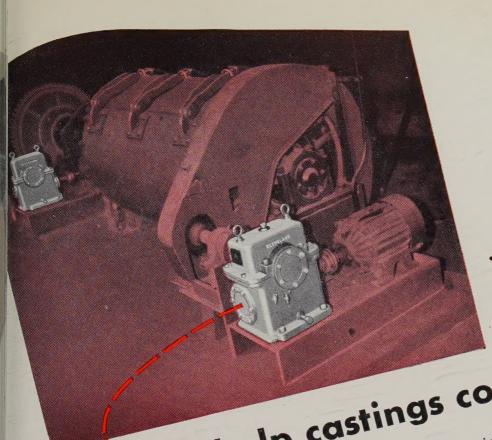
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Unit Panel Construction

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